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Alexander Gunn considers the particular **HEALTH** problems that overseas students face and argues for greater sensitivity and sympathy (page 14)



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The Great Debate

Too much and too little

The University Grants Committee's "great debate" runs the simultaneous risk of exciting exaggerated expectations of what it can actually achieve and leaving out entirely the most important bits about the future of the universities. This is not such a paradox as it sounds. For the UGC has much less room to manoeuvre than many people imagine and for this reason the debate has had to take place within the constraints established by the very presumptions that maybe should be more vigorously challenged.

Both aspects require equal emphasis. It would be a mistake to expect too much from the UGC; it cannot make the world come right for the universities any more than it can cast the universities into some Josephine mould to please the Government. Like all institutions that possess great formal power and influence the committee in practice is hemmed in by the hedge-like constraints of past practice and entrenched interest. Even the Robbins committee, a special inquiry without an institutional past to live down or future to live up to operating in a much more favourable political climate, was able to do little more than articulate the prevailing consensus within higher education which at that time was so generously shared by lay society. Today the UGC cannot aspire to do even that in its present "great debate".

So to suggest that the outline of the advice which the UGC will send to Sir Keith Joseph in the summer is already reasonably clear even before the closing date for submissions is not to allege that the committee has approached the whole debate in a spirit of cynicism. It is merely to recognize the narrow range of possibilities that face Sir Peter Swinnerton-Dyer and his colleagues. Cries of "it's all a fix" are quite literally beside the point because they imply that the UGC is faced with a blank piece of paper on which it can write what it wants rather than a densely covered sheet on which it can only underline a few of the more prominent phrases or scribble a few cramped notes in the margin.

Perhaps the most important point to grasp about the "great debate" is that it is almost as much about the past as the future. The debate is partly a catch-up exercise, a retrospective even. It provides an opportunity for universities to come to terms with the great and irreversible changes that have already taken place, not so much the setbacks since 1979 which given a vigorous political will can be reversed but everything that has happened since Robbins 21 years ago.

Universities have come a long way since Robbins and the UGC's present debate has the virtue of providing a decent perspective in which to view these changes. After all the values and practices, psychology even, of a higher education system of 216,000 students, most of them in universities, operating in a benign society committed to optimistic growth were inevitably and necessarily different from those of today's system with more than half a million students, a substantial proportion in a much more austere and pessimistic climate. For those in uniform the spirit of the late 1960s is forever, the retrospective quality of the UGC's "great debate" may be particularly significant.

Just as this debate cannot rewrite but only recall the immediate past, so it can do much less to influence the future course of higher education policy than either the UGC (perhaps) or its critics (inevitably) suppose. For instance the committee has to encourage a further swing to science and technology. This government, like all its predecessors since 1945, wants it; employers want it; students (at last) want it and majority opinion in the universities wants it either because of the dominant influence of scientists and engineers or because it is recognized as the university's strongest card in the battle for resources. Where the UGC does have some limited freedom for manoeuvre is the degree of public sympathy and practical support it offers to the "minority" humanities and social sciences.

Similarly the UGC has little option but to support some clearer identification of money for research. The dual support system has been in full decay for more than 10 years and cannot be rebuilt by the exertion of nostalgia; the research councils, and in post-Rothschild days Whitehall departments, are well on the way to taking over university research entirely, an outcome which the "new blood" initiative has shown would introduce grave distortions; and university unit costs, inflated by research support, are becoming a heavy handicap in the rivalry with polytechnics and colleges. Again the UGC enjoys only the limited freedom of whether to speed up or slow down this inevitable movement towards the separation of teaching and research money.

Indeed it is possible to go through almost all the UGC's 28 questions and make a plausible guess at the committee's likely preference on each one. On tenure a compromise - no retrospective action to rob university teachers of tenure but revised contracts for new staff that allow for redundancy, plus the now routine package of more "new blood", tougher probation, standard early retirement. On the binary policy no essential difference between the two sectors: the universities are just much better. On privatisation "up to a point, Lord Copper". And so on. The UGC's advice is already fairly predictable, which is not so much a comment on the committee's limited vision or its fixed prejudices but simply a reflection of the constraints of *realpolitik* to which it is inevitably subject.

But just because it is a mistake to expect too much from the UGC's present debate it does not follow that we should remain silent about the intellectual, even moral, poverty of its terms of reference. For the most important bits have all been left out. The fundamental questions that need to be asked about the role of higher education in a late twentieth century post-industrial society (but without the material abundance which that phrase has traditionally suggested) are not even asked. Even less fundamental and more technical questions about higher education can best contribute to the creation of social wealth are not properly addressed; they are left wallowing in naive formulations ("engineering good, sociology bad") rather than subjected to an even half-rigorous analysis.

At the beginning of February we suggested that the present "great debate" was a very pygmy affair compared with the high Victorian debate about the nature of the university which had as protagonists Newman, Arnold and Huxley. This criticism seemed to many, including the chairman of the UGC, a little unfair; it was not the intention of the present debate to stimulate a grand intellectual contest but to sort out higher education's priorities for the next ten or 15 years. But, if it is fair to regard the present as a moment like Robbins but without a Robbins report, it is worth recalling that Lord Robbins and his committee did tackle these fundamental questions of descent from Newman, Huxley, Arnold and the rest.

It is easy to understand why these fundamental questions do not appear in the UGC debate. They are habitual, avoided in higher education at large. Disciplinary and professional specialization has decisively shifted the territory of the modern university away from the broader intellectual and cultural issues that lie behind these fundamental questions about the purpose of higher education. Moreover the traditional division that lasted from

1945, arguably 1919, until 1980 and still lingers allowed the universities to impose unilateral definitions of those crucial links between the intellect, culture and society. For the best part of half a century lay people have been denied the effective right to contribute to these definitions. Not surprisingly active interest in such links has atrophied.

Today the rules have been reversed. The contours of higher education are now shaped by the unreflective expediency of politicians and bureaucrats, both inside and outside the system, rather than being informed by any intellectual or cultural consensus. It amounts to an awful abdication of responsibility. For just as detailed policies for higher education cannot be determined until the placing of the universities within the system is decided, so the pace and direction of higher education development cannot be determined until some clearer thought is given to its total relationship with our economy, our society, our culture.

This lack of a satisfactory context helps to explain the myopia of the assumptions that lurk behind so many of the UGC's questions and as many of the answers to these questions. It seems to be assumed that a major improvement in the status and effectiveness of higher education would take place if more students studied science and vocational subjects and more were educated to show a positive rather than a subservient attitude to modern Britain ("fewer - preferably no - left-wing sociologists, more right-wing computer scientists" to parody this view only a little).

But these two assumptions are based on both a clear misreading of what is wrong with Britain and of the role of higher education. It is now a common place to insist that there is nothing wrong with British science, only with the way in which all kinds of new knowledge and techniques are absorbed into our economy. This suggests that the key people are not in R and D or even in the board room, but in personnel, industrial relations, sales, customer service. Such people are at least as likely to benefit from the more chaotic intellectual styles typical of social science or even the humanistic styles typical of some science and more technology. It is the well worn formula; we need more broadly educated scientists, managers and engineers, and a more technologically literate and entrepreneurially active élite - which, some would argue, is what higher education already tries to produce.

The critical role of higher education also needs to be reaffirmed, particularly at a time when the pressures of conformism and orthodoxy seem to increase every year. Universities, and indeed any educational institutions worthy of that description, are about change - personal change, intellectual change, technological change, social change. Higher education can fairly be described as a system of institutionalized subversion. For it is only through the free and vigorous competition of ideas that any kind of progress is possible. This applied to the study of sub-atomic particles and of industrial society. It is no accident that the great Victorian debates about the university came at a time when the progress of science was undermining the centuries-old orthodoxy of Christianity.

Finally, universities are also about standards, something which is hardly reflected at all in the UGC's "great debate", except in the narrow form of scientific and scholarly excellence. Perhaps there is no place in a higher education system on the brink of the twenty-first century for the perhaps dogmatic insistence of an F. R. Leavis that moral sensibility should be placed at the heart of the study of literature. But if that and similar claims are denied, the prospects for the survival of the universities' own great tradition must appear dim and feeble.



I don't suppose you'd like to, for a moment, registrar? Well, thank you, vice-chancellor. Just for a second if I may.

There. Thank you. Isn't it beautiful, compact, and yet so full of meaning.

The final, final, final version. Just 24 hours before the deadline. Do you remember those greyed back in February when it seemed impossible?

Who could forget them, a chancellor. Sixty-three and contradictory responses from every department and sub-department in the university.

Forty-seven subcommittees. One hundred and twenty drafts.

Ninety-four references back. Five hundred and forty copies of the original UGC letter.

The nine-hour debate on scene before the vote to exclude a word "Judas" from our answer to the question on the recent role of the UGC.

But then there were the high moments, vice-chancellor. Indeed, indeed.

The political science department insisting upon that reference to the Owl of Minerva.

And entering committee reading that reference to subversive courses.

Yes, yes. And sorting out the infinitives in the AUT response. And Professor Dogberry's berserk at faculty board on tenure.

Oh yes. Unforgettable. "Tenure is inviolable. Tenure is inviolable." Banging the table with his shoe.

Punching the deputy bursar. Oh yes. And dear old Professor Emwott jogging around outside the council chamber with the "Who's too old at 60?" placard on her chest.

Memories. Memories. And the whole enterprise crowned, if I may say so, vice-chancellor, by your final paragraph.

You mean the bit about, "all, taking every special interest into account, ignoring any one which might be remotely radical, looking at the matter with resolute objectivity, but not being afraid to face the future and recognize the importance of electronics, it is the firm belief of this university that things should stay exactly as they are."

Thank you. Well, into the envelope it goes. God speed. Erm... registrar. Just before you seal it.

Pop in this £10 note, will you? One never knows. Quite so, sir.

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'Escape clause' hint from UGC

by John O'Leary

Sir Peter Swinnerton-Dyer, chairman of the University Grants Committee, has given the clearest warning yet of institutional closures in higher education if student numbers reach the level predicted for the 1990s.

However, Sir Peter stressed that he was optimistic about finding "an escape clause". No decisions on higher education in the 1990s would be needed until after the next general election, by which time the Government's initiative to improve standards in schools might produce a larger pool of qualified applicants.

He told a conference in Cambridge last week that the university cuts of 1981 had an appalling effect, and another round of early retirements would be very difficult to achieve. Even a 10 per cent cut would be traumatic.

"If there really is going to be such a cut in numbers and therefore in resources, the least damaging way of dealing with it is going to be not

spreading the cuts around but the entire closure of a limited number of institutions of higher education". Sir Peter said.

Although he did not specify types of institutions, he implied that universities would be included by going on to discuss the role of the UGC in advising on closures. "I do not see that the UGC could possibly cope with the question of which they are," he said.

"It would be destroying its chance of carrying out its normal role and would tear itself apart. The secretary of state might very well not follow its advice because the considerations are not solely educational. The decision is going to have to be taken by the secretary of state or, more probably, by the Cabinet as a whole."

A need for more graduates in particular areas, such as engineering and education, and for a bigger research effort however would weigh in favour of preserving the current size of the university system. "We simply cannot afford the gloomier predictions to



Sir Peter: still optimistic

come about," he said. For the moment, however, official estimates will remain close to those published last year by the Department of Education and Science. This year's student numbers have not reached the

lower of the DES projections and it is expected that the review of those figures, due to be completed shortly, will produce only a marginal increase in predicted student demand during the 1990s.

Sir Keith Joseph, Secretary of State for Education and Science, who also addressed the Careers Research and Advisory Centre's conference *A New Role for Higher Education*, pinned his hopes on the schools initiative. But he said that unless the number of potential students qualifying for higher education increases sufficiently there will be a nasty choice to be made. Either higher education will have to lower standards, which he would oppose, or it would have to lower numbers.

"I am realistic enough to say that I think there will still be a decline in the numbers qualifying due to the steep demographic decline, and the higher education will have to adapt to some extent to a smaller market," said Sir Keith.

College heads want to join CDP

by Karen Gold

The heads of six of England's largest colleges of higher education have applied to join the Committee of Directors of Polytechnics.

A paper presenting the claims of all six colleges for quasi-polytechnic status will be considered by CDP members at their annual residential conference in Edinburgh next week.

The colleges involved are Bolton Institute, Chelmer Institute, Derbyshire College, Dorset Institute, Ealing College and Humber College. All currently belong to the Standing Conference of Principals and Directors of Colleges and Institutes in Higher Education.

The principals have asked the CDP for associate membership, which exists in the CDP constitution but is not clearly defined. The college heads want to mean membership with everything, but a vote. They want particularly to be included in the new central polytechnic admissions scheme starting next year, and to be represented by the CDP in negotiations with

the Government and national bodies.

Their paper says that including them will give the CDP similar status to the Committee of Vice-Chancellors and Principals. "The inclusion of the six colleges will ensure that approximately 93 per cent of full-time advanced further education is represented by CDP," it says.

The six principals have already had informal meetings to discuss this with the CDP, the Department of Education and Science, the National Advisory Body and the Council for National Academic Awards. With those bodies, they worked out the criteria by which colleges should be included in the applications as "the key centres around which national and regional planning can be based".

Those criteria included a wide range of work with a minimum of 1,000 degree-level students, an established undergraduate teaching and CNAA reputation, more than £5.5m worth of NAB funding, potential for growth and local authority commitment.

The addition of the six colleges

would not only ensure the CDP represented a more comprehensive regional spread of major institutions on which future regional planning and development will be based, the paper says. It would also give the CDP more weight in its difficult relationship with the Council of Local Education Authorities, by encouraging CLEA to regard the CDP as even more representative of the public sector, it adds.

Mr Michael Salmon, principal of Chelmer Institute, said the colleges were not asking to be designated as polytechnics. "The title is much less important than defining the major institutions which form the public sector and upon which growth and concentration will be placed," he said. The CDP did not wish to comment.

The colleges have told the standing conference about their application to the CDP. Some of the six principals are understood to feel that if the application is turned down, they would rather set up their own organization of major colleges than continue to be represented by the conference of small and diversified teacher training colleges.

The Great British University Miracle, 14-15

Extramural funding change

A new formula for calculating grant payments to extramural departments, based on student numbers and class attendance, is emerging from discussions between officials of the Department of Education and Science and representatives of the Universities Council for Adult and Continuing Education.

The new system, if adopted, would take a retrospective budgetary view, basing funding calculations on performance during previous years. At present, extramural provision is assessed by advance financial planning of the curriculum and teaching staff requirements for the year ahead.

Extramural departments would also be obliged to revert to a system of regular student registration, and only "effective students" - those who had maintained their attendance and completed written components of the course - would be counted in terms of calculating the following year's grant aid.

In assessing grant aid, the DES would base 80 per cent of funding on student numbers, with about 15 per cent of the total sum dependent on staffing, and 5 per cent on other sources of funding available.

Senior members of the UCACE are engaged in a joint exercise with the DES to examine how the system would work using purely as examples groups such as unemployed, elderly, ethnic minorities and handicapped people.



Strathclyde's west side story

Staff at Strathclyde University have been sent a questionnaire asking if they would like to buy or rent houses near the university - in the somewhat unfashionable, not to say run down East End of Glasgow.

The questionnaire is the idea of Strathclyde's principal Dr Graham Hills. It says there might be some interest among staff as the area "is being improved".

However, prospective buyers or tenants might do well to consult one member of staff who already lives on campus. He is Dr Hills, who is currently busy househunting in the more suburban environs of Glasgow's West End.

IT programme is announced

The University Grants Committee is to assess how its programme of extra posts in information technology has affected students.

A further 46½ information posts were announced this week, making a total of 116½ posts in two years, which are aimed at boosting qualified staff and expanding research. Each post carries an extra student place.

London University gets seven of the posts, Edinburgh five and Cambridge

four, with the rest shared by 20 other universities.

The universities have been asked to assess the impact of the programme. The UGC particularly wants to know whether the appointments will make possible new courses or options in information technology and to what extent the new staff will supervise research students.

Full details, page 7

Institutions 'need help to survive'

Colleges which have a high potential but face closure because they do not meet the Government's criteria on teacher training should be given more students to help them survive.

This is the radical view of Mr Keith Thompson, chairman of the National Advisory Body's teacher education group, expressed in a personal position paper which could indirectly affect the current colleges reviews being undertaken by the NAB's study group.

"The teacher education group should set itself the task of being ready to change institutional allocations in order to protect those institutions which are judged to have highest potential, even though this will involve a strong element of subjectivity in the judgments made upon them," Mr Thompson says.

Mr Thompson points out that this will be necessary because it would be a serious mistake to have a single cut-off line in a continuum of institutions. At one end there are colleges which meet all the criteria and at the other there are those which do not meet a range of criteria.

"The reason for this is that there will be institutions which because of decisions taken in previous planning exercises have not been given the opportunity to work from the base of what has already been postulated as necessary conditions for quality work," Mr Thompson says.

Mr Thompson also takes the opportunity to point out to the group that it is not part of its role to determine its own priorities or preferences with regard to the content of teacher training courses. It will have to adhere to the criteria set by the proposed Council for the Accreditation of Teachers.

He also makes it clear that the primary source of guidance in the review of teacher education will be Her Majesty's Inspectorate. Such advice would be checked against the perceptions of the Council for National Academic Awards and the validating universities.

The group is also reminded that it should be prepared to make recommendations on possible changes in universities' teacher education provision. These could include either a cut or an increase in the number of places in universities, to balance provision in the public sector.

Letters to the editor

Philosophers for all disciplines

Sir, — Alan Wilson ("Adding a degree of subtlety", *THES*, March 23) shows with great philosophical verve that there is more to knowledge than information. If theories, or even values, always permeate facts, there cannot be that crucial moment of pure empirical truth which observation is supposed to furnish. In that case the "hard" sciences do not rest on rock nor are the "soft" disciplines disreputably squishy.

But I doubt whether the "insights of positivism" can survive its conversion to a view of knowledge as a social product relying on consensus. He has gone too far down a relativist road. Truth still has to be, somehow, the test of consensus, not merely its wish-fulfillment. Yet I agree that, without neutral facts, falsification has the logical snags of confirmation. The puzzle is how to square the active work of

interpretation with the need for objectivity. With this puzzle unsolved, philosophy is not a neutral tool or noncommittal training. But it is nonetheless worthwhile for having the clash of opinions built in. This part of Alan Wilson's message comes over loud and clear and should excite all who reflect on their own pursuit of truth. Let us hope that the moral is not lost on those who finance the pursuit.

Yours etc,
MARTIN HOLLIS,
School of Economic and Social Studies,
University of East Anglia.

Sir, — It was heart-warming to read Alan Wilson's article, commending the benefits, despite the difficulties, of philosophy to practitioners of all subjects. This advocacy of a critical

dimension at the foundations of all disciplines is something to be welcomed.

Apart from the warm heart, the cool head may wonder why he stopped at structuralists as the "newcomers" and "invaders". More recent phases of deconstruction and, indeed, post-deconstruction, have moved the debate on to deal with some of the questions of relativism that Professor Wilson's argument leaves hanging in the air. Perhaps also, his liking for the word "positivist" (but in a sense that moves away from its early connotations), makes the usefulness of his position harder to appreciate; why not "empirical" or simply "experiential"?

However, these are curping criticisms of a very necessary appeal. No one need write and point out the difficulties of introducing yet one more specialist interest into crowded time-

tables! A group of us in Lancashire, working to develop this dimension at both undergraduate and sixth-form levels, is already being made painfully aware of the problems. Two, however, worth highlighting: the relative absence of good resources for this dimension; and the more subtle dangers of confusing objections to the development of this critical level in all subjects with resistance to the promotion of formal courses in philosophy.

The encouragement of students to a level in every subject at which they can be constructively critical of assumptions — their own as well as the "persuaders" — is an educational goal for which it is worth struggling to overcome quite a few barriers.

Yours faithfully,
DR. W. D. ROBINSON,
Edge Hill College of Higher Education, Ormskirk, Lancashire.

Further information

Sir, — I was interested to see Dr. Santinelli's report ("Double role", *THES*, March 23) on a far-Edinburgh Unit internal document; it was confidential perhaps, but your readers a little more so.

The report, excellent as it remains nevertheless a summary much longer document, which was discussed at some length by the Board of Management.

Training for Jobs presented by FEU, as well as many other options, the need to appraise the Part of the remit of the FEU as "review and evaluate the range of further education curricula and

rammes and to identify, over application, deficiencies and inadequacies therein". This we do to the best of our ability, and part of our credit at least is due to the fact that we identify deficiencies, report on them objectively as we can and, within resources, provide curricular suggestions to remedy those deficiencies.

Notwithstanding our review last year, the FEU was not part of a consultation process that led to the White Paper and the internal document on which you reported was part therefore, an attempt to establish the basis of the assumptions that we contained within the White Paper.

After its discussion, the Board of Management decided neither to comment on the assumptions nor on shifts of control and resources it was described. The Board did, however, reaffirm its policy of supporting the further education system over the whole range of education and training.

It restated the need for FE to be responsive to the widest range of consumers; and promised to support the FEU in negotiating with other agencies, including the Manpower Services Commission, to secure consistent provision of good educational practices.

I was authorized to indicate to the MSC and the Department of Education and Science that the FEU willing to discuss and respond to appropriate initiatives, and to review and comment on the changes that take place in FE.

Yours faithfully,
JACK MANSFIELD,
Chief Officer,
Further Education Unit.

Nigeria

Sir, — As a person with some first-hand and recent knowledge of the subject (I was in Nigeria for 18 months, March 1984), I have great cause to deplore the manner in which Bloom and Woodhouse discuss Nigeria's universities and colleges ("Providing answers without questions", *THES*, March 9). So little is said about the evidence on which this analysis is based that the reader is quite entitled to suspect that most of it was gossip on a campus. The basis for the cultural professed knowledge of "the needs of the people" is even less clear.

The severe judgments about educational practice through realistic in part, are not launched by any recognition of its substantial merits in particular, its intellectual autonomy and by their teachers, its institutions and their teachers.

Bruton and Glasson claim: "Today's planners (are) often the catalyst bringing together private and public sector resources in the interests of the community." I can assure Messrs Bruton and Glasson that the real interests of the community come very low in many planners' list of priorities.

Bruton and Glasson also claim that planners have a key role to play in solving the problems of the inner cities. If that is so, they have been singularly unsuccessful so far. Their complacency cannot be good for the students who need to develop a much more critical view of the real harsh world of planning outside the cosy educational institutions.

Yours faithfully,
SEEMA MONTFORD,
Director, Lewis Cohen Urban Studies Centre, Brighton Polytechnic.

Letters for publication should arrive by Tuesday morning. They should be short and snappy, and written on one side of the paper. The editor reserves the right to cut or amend, and to return any material not accepted.

Ulster plans £4m growth for Magee

by Paul McGill

The proposed University of Ulster has released details of a £4m development plan for Magee College in Londonderry, designed to raise the number of equivalent full-time students from 167 to 791 by 1990.

The university, whose charter and statutes are believed to be proceeding smoothly through the Privy Council, wants to build a 7,200 square metre building on the Londonderry campus at a cost of £3.6m.

Refurbishment of the existing buildings could cost another £500,000 and the recurrent budget is estimated to rise from £289,000 in the coming academic year to just under £1.5m in 1989/90.

The plan has already been discussed by the Northern Ireland working party of the University Grants Committee and the UGC itself and the university is confident that it will be approved. It is done speedily it hopes the new building will be ready for occupation by the autumn of 1986.

By then it is hoped that Magee will have built up full-time student numbers from 95 to 389 and part-time enrolments from 179 to 551. In the following three years further growth is expected to 567 full-time and 559 part-time students, a full-time equivalent of 791.

The total number of part-time and full-time students by the end of the decade is estimated as: science (computing) 139; technology 76; business and management 239; social and health sciences 176; education 162; adult and continuing education 151; art and design 66; and humanities 117, a total of 1,126.

The expansion will be spread across all faculties, to include accountancy, teaching studies for nurses, cooperative studies, peace studies, engineer-

ing, agricultural technology, community drama and music.

New courses will be mounted this September regardless of the fate of the development plan, including full-time programmes in hotel and tourism management, Irish history, politics and society, social administration and housing studies, business studies, and advanced computing. A large range of part-time courses is also planned.

While the plan was welcomed by people involved with Magee, and especially the Londonderry civic committee, the whole process of creating the university has come under criticism from the National Association of Teachers in Further and Higher Education.

Its regional chairman, Mr David Montgomery, told the union's annual general meeting that there was now no evidence of the euphoria with which staff at the Ulster Polytechnic first greeted the merger with the New University of Ulster.

"The merger is viewed with doubt and suspicion. The chronic and appalling lack of information and consultation has led to countless rumours and uncertainties. Morale is low. We have consistently been denied meaningful access to the decision-making processes," he said.

Mr Montgomery, who is a lecturer at the polytechnic, accepted that considerable problems faced the university but argued that these could be overcome only with the wholehearted involvement of the entire academic community.

"Directorial management creates a 'them and us' complex. It is divisive, not uniting, and I am concerned that it will be counter-productive and self-defeating."

He also complained that level funding meant that intakes would have to be pegged in September even though the number of applications was rising considerably.

Engineering conversion courses drive urged

Mr Norman Tebbit, Secretary of State for Trade and Industry, and Mr David Young, chairman of the Manpower Services Commission, have urged a dramatic increase in the number of graduates in engineering and technology by 1990: 25 per cent more than the planned output in 1986/87.

At a recent meeting with Sir Keith Joseph, Secretary of State for Education, they said the increase should be maintained even if student numbers fall by up to a fifth in the early 1990s.

That would bring the number of graduates in those fields up to about 9,000 by 1990. But Messrs Tebbit and Young are also urging more immediate action. They want to see a major drive on conversion courses, both for post-graduates and to enable school-leavers to change to other subjects before entering higher education. Mr Young is believed to have offered MSC funds for this purpose.

The Department of Education traditionally sceptical of manpower planning, favours less drastic action. It

thinks a total output of some 16,000 graduates by the end of the decade is the most the system could manage after the recent rapid increase. And the University Grants Committee shares its scepticism about too rapid a switch.

DES officials stress the long "lead time" required to bring about a shift in graduate output. It takes nine years, they say, starting with the choice of O level options. Expanding too fast now would mean a drop in the quality of applicants.

Rather unusually, the DES has the Treasury on its side in this debate because the small expansion it favours could be accommodated within current spending plans. A big increase in engineering places would undoubtedly be expensive.

Now officials in both the Department of Education and the Department of Trade and Industry are working out detailed implications of the two options.

TES

Salford fortunes on the upturn

A dramatic turn-round in the fortunes of Salford University has been announced by its vice-chancellor, Professor John Ashworth.

In contrast to a 1981 forecast of a £6.5m deficit by 1983/84, the university is now expected to balance its books. Professor Ashworth told the university court that there had been a threefold increase in the value of research grants and contracts won by the university, while the gross income of its industrial centre had leapt tenfold.

"All in all, the university (including the industrial centre) obtained 29 per cent of its total income from non-University Grants Committee sources last year compared with 20 per cent the year before and an average 10 to 15 per cent for UK universities as a whole."

But he said it would be unlikely, improbable and unwise to try to obtain more than one third of Salford's income from non-UGC sources. And he accused the UGC of failing to honour the dual-support system at Salford.

NAB sets cash and student forecast

by Karen Gold

The National Advisory Body committee has agreed cash and student number projections for local authority higher education until 1987 which imply an additional squeeze on resources.

At its meeting this week committee members repeated fears expressed last month by the NAB board that the figures calculated by the Department of Education and Science would cut still further the amount of money allocated per student, the unit of resource.

The projected advanced further education pupil allocation for 1985/86 and 1986/87, following government announcements of public spending plans, will increase by approximately 3 per cent: from £580.5m in 1984/85 to £597m in 1985/86 and £615m the following year.

Student numbers are expected to increase by just under 1 per cent in 1985/86. The most they might increase is 1 per cent, and any fall would be fractional. In all three cases, the allowance for pay and price increases would be between 2 and 3 per cent, so

that any increases above that would mean a cut in the unit of resource.

Committee members were "seriously concerned" about that, according to a NAB official, after they received a motion from the board saying it was concerned about "the almost inevitable further erosion of the unit of resource in the local authority sector".

NAB officers will now write to all institutions and local authorities by the end of this month telling them of the financial and student number implications.

Ministers relent on travel

by David Jobbins

Ministers have subtly taken the edge off the rough justice they admit will arise from a new way of meeting student travel costs.

While new arrangements announced in the Commons this week by Sir Keith Joseph, Secretary of State for Education, will apply to all new students from the beginning of the 1984/85 academic year, they have conceded that existing students with heavy and unenviable travelling costs should be protected.

Currently students reclaim travel costs in excess of the £50 included in their maintenance grants. From next year the amount included in the grant for student studying at home will be increased to £160 and those studying away from home to £100 but the time-consuming and costly exercise of reimbursement by local authorities will be ended.

Under the concession announced by Sir Keith, existing students whose expenses are more than £150 above what they will receive in their grants will still be able to claim reimbursement.

Sir Keith said: "Those consulted have expressed a real and well-founded concern about the position of some students already on courses who have both exceptionally high travelling costs and little real possibility of changing their circumstances in mid course so as to reduce these costs. I am sympathetic to those concerns."

Overseas travel costs will continue to be reimbursed and disabled students will also be able to reclaim costs in excess of the element in the grant.

The new main rates of grant for 1984/85 will be £2,100 for London-based students, £1,775 for students elsewhere and £1,435 for those based at home.

The National Union of Students rejected the concession as a token gesture and calculated that 125,000 students — about one third of all receiving maintenance awards — would be up to £150 worse off.

Sir Keith also announced new extra allowances in response to the "strong case" made to him by clinical, medical and dental students who have longer than normal college years. As well as the 4 per cent increase for all rates of grant and increases in line with the new travel grants, the allowances will rise by an extra £2.80 a week to £48.60 for London, £37.80 elsewhere and £26.50 at home.



Fashion student Joan White, who designed these Samurai-style outfits made of dishcloths, chamols and string, was one of a group of students at Middlesex Polytechnic who were the only polytechnic students invited to exhibit their work in the official designer tent of the London Fashion Week.

Fewer firsts for women

Women university students gain fewer firsts and fewer thirds, according to research conducted by Dr Ernest Rudd, of the sociology department at Essex University.

Writing in *Studies in Higher Education*, Dr Rudd says that for degrees awarded in 1979 women did better than men in education, medical subjects, engineering, agriculture social studies, architecture and other professional groups.

"They performed markedly worse than men in those fields in which they are disproportionately strongly represented — the two groups of arts subjects."

He says the only explanation that fits all the facts is that there is a lower percentage of women than men with extremely high levels of measured intelligence.

A comparison between the results achieved by women and men studying for first degrees in British universities by Dr Ernest Rudd, in *Studies in Higher Education*, Volume 9, No. 1, 1984, Carfax Publishing Co, PO Box 25, Abingdon, Oxfordshire.

for women's poor record of firsts: prejudice by academics, particularly examiners; social pressure affecting women's performance in course-work; a sex-linked medical or psychological condition, perhaps a different reaction to examination stress, or perhaps manifestation of a difference between the sexes in their distribution of abilities or other psychological characteristics.

He says the difference in performance between the sexes has remained unchanged despite changes in attitudes to women's careers and sex equality. He cites four possible explanations

College gets CNAA all-clear

Glasgow College of Technology has been given a clean bill of health by the Council for National Academic Awards, four years after a harsh report attacking the college management.

The CNAA criticized the director at the time, Dr Reginald Beale, for taking decisions without adequate consultation, and said the college was characterized by low morale and lack of trust.

Strathclyde Regional Council, which finances the further education college, subsequently conducted its own review of the college concluding that there was a tendency towards dictatorship. Dr Beale later retired five years early from his post.

The CNAA postponed its decision on recognizing the college's courses, and while saying the college had shown progress, it has only now been confirmed as a suitable institution for CNAA awards.

Concern over senior posts

University administrators are concerned at a growing trend of appointing people without experience of higher education to senior jobs.

They are particularly worried at a tendency to offer top jobs to retired army and other forces personnel. At least two people who had not previously worked in universities have been appointed to senior posts in the past year, according to the Association of University Teachers.

And last week the union's administrative staff annual meeting agreed to seek an undertaking from universities that recruitment to jobs on the top two salary grades should be within the university and higher education service.

Assistant general secretary Ms Tina Day said the union was in no sense seeking a closed shop but suggesting that in the first instance there should be a draw for qualified and experienced candidates within the higher education system.

File freedom

Sir, — In connection with the Data Protection Bill the Committee of Vice Chancellors and Principals wish to disclose "raw scores" only with the delivery of the final exam verdict. This amendment will probably be granted, as if not the universities will simply put this information on manual file which is not covered by the Bill.

This raises the question why should there be right of access to computer held information but not to information held in manual files? A great deal of important information

is held and no doubt will continue to be held on manual files. For example student assessment: one might be forgiven for thinking that a teacher is under a professional obligation to tell his student how he is progressing and that this feedback is an integral part of the teaching/learning process. In fact the universities admit no obligation to tell a student how he is progressing if they do not so wish.

If a student does not know how he is progressing he can neither plan his immediate work nor make informed choices about future career.

How can the universities justify such an iniquitous situation? Freedom of information should include right of access to manual files, in addition to computer files, the both being available during as well as at the end of the course.

Yours sincerely,
BARRY ADAMS,
Reform University Law and Education Standards,
Jerusalem House,
Orchard Terrace,
Totnes, Devon.

NELP staff

Sir, — So "Staff rush to leave NELP" (*THES*, March 16). One of the results of Gerry Fowler's tenure as assistant rector in the 1970s at Huddersfield Polytechnic was a burgeoning, not a spontaneous generation in the number of staff, particularly on the administrative side. We paid the price for success and accomplished: lectures were encouraged, themselves being persuaded into early retirement.

I find the relative figures of retirements at North East London Polytechnic very interesting as far as three only out of 64 (or 82?) are from the "polytechnic's administration."

Yours sincerely,
JOHN ADAMS,
28 Edgemoor Road,
Marsh, Huddersfield.

Metal detection

Sir, — The Metals and Materials Education Association is seeking to contact all those involved in the teaching of materials technology at the engineering technician and technician engineer levels.

The main aim of the association is to provide a national focus for debate and advice on education and training in metals and materials technology and allied subjects.

The aim is broad but is intended to bring together all those with a common bond of metals and materials in whatever discipline. Further information can be obtained from me at the address below.

Yours faithfully,
F. TOPPIS,
Secretary,
c/o Sturbridge College,
Sheffield.

Planning ahead

Sir, — I can understand that Michael Bruton and John Glasson have an interest in retaining the present number of town planning courses (*THES*, March 9) but they go too far in claiming that the professional planner is the answer to so many of society's problems.

They mention "the quality of many of our towns and cities and the beauty of our countryside... have been well served by planning..." Who then is allowing this quality to continue to deteriorate? Even if planners are not solely responsible, they must share in the responsibility for this deterioration.

Bruton and Glasson claim: "Today's planners (are) often the catalyst bringing together private and public sector resources in the interests of the community." I can assure Messrs Bruton and Glasson that the real interests of the community come very low in many planners' list of priorities.

Bruton and Glasson also claim that planners have a key role to play in solving the problems of the inner cities. If that is so, they have been singularly unsuccessful so far. Their complacency cannot be good for the students who need to develop a much more critical view of the real harsh world of planning outside the cosy educational institutions.

Yours faithfully,
SEEMA MONTFORD,
Director, Lewis Cohen Urban Studies Centre, Brighton Polytechnic.

Lording it

Sir, — 1984 is alive and well in the House of Lords, with Lord Annan reportedly relishing the prospect of monotheistic institutions, untrammeled by departments of philosophy, training their students for "strictly vocational" ends.

Polytechnics such as Hatfield have developed into balanced academic communities, in which humanities undergraduates learn something of science, and prospective scientists are enabled to follow interests in the arts. Let us hope that our graduates leave with a sufficiently broad view of education to allow them to tolerate the continuing coexistence of philosophy with information technology.

Yours faithfully,
B. C. SOUTHGATE,
School of Humanities,
The Hatfield Polytechnic.

DON'S DIARY

MONDAY

It's the last week of the spring term and essays are mounting up like archaeological layers on the desk in front of me. Another student comes in with an unlikely topic for a dissertation. I plunge helplessly into the layers of paper searching for inspiration and a moment to think. I tell the student that I think that the topic is a good one, but that perhaps it needs a bit of pruning, nothing drastic, but a bit of refinement, a little more "definition". The student asks me to be more precise. I say that it's important that the dissertation should have a clearly marked beginning and, preferably, an end as well. Then, I add, before the protests start, that there should be a definite theme, a sense of knowing where one is going, nothing too elaborate at this stage, but certainly a distinct feeling that the argument is proceeding in recognizable steps. Then I add, for good measure, a recommendation that a list of sources should be drawn up at this point so that I will know that there is sufficient material for the project. I emphasize that I have not forgotten that the "collected works of Marx and Lenin" will be the central source of inspiration, but I plead for some indication as to how this source will be deployed in the service of the proposed theme. I point out that it may not be apparent to the man, or rather person, in the street, the exact relevance for the topic which the student had earlier said was "personal interactions in prison cells in Brixton in the late twentieth century".

TUESDAY

Uneventful, except for a letter asking me to write a reference for a student I can't remember, for a job he's unlikely to get, and all this to be done by a date that has already passed. I draft a reply "recalling" the student "with pleasure", asserting his "unique qualifications for the job", and put last week's date at the top.

WEDNESDAY

The monthly Association of University Teachers' committee meeting takes place after lunch or - for some members who are disconsolately chewing plastic sandwiches - during lunch. The main topic on the agenda is the questionnaire from the University Grants Committee. Answering these questions in Northern Ireland is even more difficult than answering them anywhere else. We're clearly on the horns of several dilemmas. Do we ignore the merger between the University of Ulster and the Ulster Polytechnic on the grounds that we're not really competing for the same students, or do we try to do what they're doing but try to do it better? This raises the thorny subject of complementarity. Do we accept the argument that our university should specialize in different areas from those pursued at the new institution on the grounds that there must be at least one place in Northern Ireland where students can follow a particular degree subject? Or do we believe in a way consistent with a view that we are a national (to the United Kingdom university) and that the provincial context, simply too constricting? Then again, how do we reconcile our aim to be an international centre of excellence in some fields (eg. medicine) with the diff-

culty we would have in attracting funds from local industry as the Government seems to want us to do? Can we accept the Government's projections on student numbers when birth rates in Northern Ireland are quite different from those on the mainland and, in any case, the mainland projections have been widely discredited? More broadly, if universities are supposed to mirror the societies they inhabit, what is our role? To be provincial, to be British, or to be European? As a light relief from these weighty questions' problems, the honorary secretary reports that AUT subscriptions are likely to go up again to cover "essential activities" such as sending smoked salmon to hunger striking students in Ruritania. At the other end of the table a row is brewing over whether a member who has arrived late should have the whole meeting up to that point summarized for him.

THURSDAY

Another uneventful day except for two phone calls - one asking me to write an article on reconciliation between Catholics and Protestants, the other inviting me to draft a questionnaire for the BBC who want to do a programme on why Catholics and Protestants can never be reconciled. I agree to do both.

FRIDAY

Today is Rag Day. Classes are cancelled. A welcome opportunity to mark essays, review books, write references, and scrutinize exam questions for the last time to purge the odd split infinitive or rectify some roguish syntax. All these good intentions come to naught when a Japanese visitor arrives announced only by a scrawled postcard a month previously and long since forgotten. He's just arrived by Shuttle from London and he's here to study the Northern Ireland problem (and probably hoping to solve it by leaping it like most of our foreign visitors). He grills me for two hours in execrable English on the topic of Northern Ireland. His questions come like machine-gun fire and cover a bewildering range of subjects: divorce legislation, Marxist views of the conflict, church attendance by Catholics and Protestants, the Plantation of Ulster in the seventeenth century, unemployment, the New Ireland Forum, the nature of God. Later, when an overdeveloped sense of obligation drives me to emulate what I've heard is the Oriental tradition of boundless hospitality, I take him to a local wine-bar. The questions continue remorselessly. What are the students throwing at each other? Flour, I reply. Why flour? Because it's Rag Day. A day when students collect money for charities. He pauses, having apparently slaked his thirst for knowledge. But no. How does throwing flour help them to collect money? I'm lost for an answer and steer his attention towards the menu. What's a courgette, he asks. I draw a vaguely phallic shape in the air, which only puzzles him further, and provokes some female hilarity at a nearby table. Alas, he's teetotal. I expound on the role of alcohol in Irish culture. But I'm shamed into ordering Perrier water for both of us. Why does water cost 45p a glass he asks suspiciously. Because it comes a long way, I explain, and then add, helpfully, it comes from deep underground, in France. Later, attacking his food with enthusiasm, he repeats "this courgette with a fork." "Cucumber," he says triumphantly.

Eddie Moxon-Browne

The author is senior lecturer in politics at the Queen's University of Belfast.

Aspiring authors of Don's Diaries should note that they should write about 1100 words - and need not always describe international conferences in Acapulco!

CNAA 'should lift ban on Liverpool Poly'

Liverpool Polytechnic should now be allowed to recruit students unconditionally for this autumn, a key working party of the Council for National Academic Awards has recommended. The recommendation to lift recruitment restrictions imposed on the polytechnic by the CNAA last year will be considered by the council's committee for institutions next week.

The CNAA told the polytechnic last year that it could only make conditional offers to this year's entrants until the polytechnic's academic plan had been approved and its financial situation was clear.

The council is understood to have accepted the revised academic plan submitted earlier this year, but the cause Liverpool City Council's budget - which was inconclusive last week - the polytechnic's finances are still uncertain.

The CNAA working party agreed to recommend lifting the recruitment restrictions this week, while still expecting the council's boards to scrutinize the finances and running of all the polytechnic's departments before the end of this academic year. Two courses - physics and fine art - which lost their validation earlier this year, remain their bad on recruitment. (Letters, page 2)

Sociology potential 'spurned'

by Paul Flather

Much of the potential of sociological research is being tragically spurned at a time when it could play a vital role in providing alternative ideas about the fluid and uncertain future of work, a leading industrial sociologist said this week.

Professor Richard Brown, professor of sociology at Durham University, used his presidential address to more than 400 delegates at the annual conference of the British Sociological Association to make a spirited statement on the continuing and important role for sociology in the debate over new work patterns.

With the Government no longer committed to full employment and the future of work perhaps more uncertain than at any time since the Industrial

Revolution, the need to review ideas on work was now more important than ever before, he told the three-day conference at Bradford University.

Higher and further education cuts had added to the problem. "The opportunity for education established as the norm of the 1960s has been abandoned. But nothing, not even the certainty of at least a dead end job which was on offer then has been put in its place."

Sociologists had a responsibility to monitor the changes which were occurring, he said, to critically review the impact of developments in economic and social policy, to explore alternatives, and to bring the accumulated fruits of 40 years of study to bear on current problems.

The programme of the conference - involving some 150 papers on the

theme Work, Employment, & the Future - was "no shortage of sociological research and rethinking was necessary," he said.

"Tragically now much of this contribution is spurned," he said, "as funds for research are being pressed on those in teaching, unfilled, and the value of sociology officially denigrated."

He criticized the official Government view of developing social sciences, increasingly to narrow technology, with little or nothing done for their causes, or the social and economic and technical change.

But he said it was too easy to be in the face of unspoken assumptions, and largely ignored by the judiciary. All social sciences activities were threatened and sociology not without friends and allies.

He recalled that in 1960-1969 became an academic - then a more philosophy done at Oxford, sociologists in the entire UK, a balanced assessment would not be a substantial contribution made sociology over the last 25 years.

The subject had also made a significant impact on everyday life, though one that needed to be fostered and developed. He gave the example of the Protestant work ethic which now a commonplace in discussion work and unemployment.

BSA wary of Police Bill

The BSA plans to take legal advice about the implications of the proposed Police and Criminal Evidence Bill on future sociological research.

The association is concerned that the wording of the Bill could be used to force social researchers to reveal material such as completed questionnaires, field work notes and interview schedules. If a circuit judge felt it would help police inquiries.

Members of the BSA executive, which is to discuss the issue, feel this could jeopardize all kinds of social research where the usual practice has been to guarantee confidentiality ab-

solutely named individuals, groups, or organizations.

This is particularly important for example when investigating crime or deviant behaviour, or extremist groups, or even so-called subordinate groups such as children in schools, or workers in factories, or prisoners.

If necessary the BSA will use allies in the House of Lords to press for amendments to the Bill. Similar fears are being expressed by the Social Research Association and the Association of Learned Societies in the Social Sciences.

Lecturers fight bid to raise hours

by David Jobbins

More than 400 college lecturers in Gwent are being urged by their union not to sign new contracts which will increase their teaching loads from September.

The Labour-controlled county council wants to increase the class contact hours of its staff from the current 2 scale by two hours to the maximum 20 hours a week, and on the Lecturer 1 scale by one hour to the maximum 22 hours a week in an effort to save £100,000 in the first year and £460,000 in subsequent years.

Notices terminating the lecturers' existing contracts from August 31 and offering continued employment on the new terms were issued last week. Some contracts have already been returned to officials of the National Association in Further and Higher Education and many more were expected to be handed back at branch meetings and at a mass meeting yesterday which was to be addressed by general secretary Mr Peter Dawson and senior executive members including Mr David Cross from Manchester, where the union fought off a similar move by a Labour-controlled authority.

An overtime ban and work to rule were imposed after the council decided to go ahead with the plan. Gwent has set an April 13 deadline for the return of the new contracts, and has warned lecturers that if they do not sign it will be assumed they do not want to take up the offer.

Councillor Graham Powell, chairman of the education committee, said: "The committee regrets the necessity to offer changed contracts of employment but regards it as inevitable in the light of government policies."

Natfhe's executive is to instruct its 76,000 members to join the local authorities in refusing to discuss or prepare for implementation of the White Paper Training and Jobs, which proposes the transfer of a large section of further education to the Manpower Services Commission.



Standing guard at Buckingham Palace are five out of six Merseyside chemists who won a Queen's Award for technological achievement in a new method of manufacturing arsenic acid used in preserving timber and brought new jobs to Merseyside.

The award was won jointly by members of the department of organic chemistry at Liverpool University and the timber preserving division of Rentokil Group. Left to right are Mr William Dillamore from Rentokil, Dr Robert Johnstone from the university, Mr Jasper from Rentokil, Professor Ian Sutherland and Mr David Harrison from the university.

NAB's make-up 'must alter' to make it more effective

Stringent criticisms of the current National Advisory Body structure and a call for a change in its constitution has come from one of the members of its board. Dr Peter Knight, deputy director of Preston Polytechnic, speaking at the Chartered Institute of Public Finance and Accountancy conference in London last week, Dr Knight said the change must take place if the NAB was to be an effective body.

"If it does not change, it is difficult to see how NAB can formulate clear policy objectives and then pursue them with sufficient ruthlessness," Dr Knight said.

The NAB is currently under review as the existing term of office of the members of the board and the committee terminate on January 31, 1985.

Dr Knight added that the portrayal of the NAB as an open body of local government was less than honest. The committee met in private and made the decisions, the board met in public and took the criticisms. The relationship between the two was a failure, and should be recognized.

"The fact that the board is nominated by interest groups has prevented it from being effective. The mechanism

Staff 'guarantee standards'

by Karen Gold

Academic standards in public sector higher education are largely guaranteed by staff in institutions, not by external pressures, Miss Sheila Browne, former senior chief inspector of HM Inspectorate said at a conference at Middlesex Polytechnic.

"We talk an enormous amount about standards in England, but we don't do a great deal about them," said Miss Browne, now principal of Newnham College, Cambridge, at the British Council conference, "Most of the time we assume they are working by themselves."

"But whenever we want to change direction or whenever we think we are spending too much money, we scream 'standards'."

Generally, she said, there was a "positive act of faith" that acceptable standards were an automatic product of certain things: student starting levels, adequate teaching and other resources, sufficiently large and varied environment, right length and content

of course, right examination system and feedback from students and employers.

But above the baseline standards imposed by validating bodies were, she said, "there will be a very wide range of performance between the best and the least good, and you have to say to yourself that you have a system that tolerates that," she said.

Validating bodies could only provide negative assurance of standards above a certain level, and could not ensure delivery, she said. What HMI would do was fairly small: "HMI may not write anything which is at variance with government policy; we can't write and say there must be extra resources; we couldn't if there were a policy of open access... write and say this would be much better if they had selection," she said.

External examiners, although they could be helpful, were birds of a feather. "If you are an external examiner, you tend to accept the range of performance that you get is appropriate

for the course," she said.

She queried the standards reached in modular degrees for example. "When you have one or two-term courses you don't necessarily have anything available at the end of it," but thought that neither external examiners nor validating bodies were distanced enough from them to ask those questions. "As long as validating bodies say that formula is degree worthy, no one can do anything about it," she said.

"On the whole in the business of standards the crucial level is the department and the department head." Institutions needed staff assessment, development and career progression and inservice training, backing by academic bodies, senior management, and a "properly curious local authority" involved in major decisions and financially supportive. "The art of the game, despite the rhetoric, is to get the right people in the right institutions and trust their motivation and the right system to deliver the goods."

NAB respondents say no to two-year degrees

by Sandra Hempel

The two-year degree is now highly unlikely because of the strength of opposition to it within higher education, Mr Leslie Wagner assistant secretary (academic) to the National Advisory Body said last week. The response to the proposals in the NAB consultative documents which were now being considered were very much against two-year degrees.

Mr Wagner told a conference of the Association of Colleges Implementing Diploma of Higher Education Programmes (ACID) that he regretted the situation and did not believe that the higher education sector had given the matter serious consideration. "To say simply we don't like two year degrees is an inadequate response," he said.

Any proposal for changing the degree must be acceptable to employers. "But we have hardly heard from the employers," Mr Wagner said. "We have heard from the education system and there is very little advantage to higher education in the proposals but there may be an advantage to society."

The diploma of higher education

had become an entry to a degree course but not a qualification in its own right. But did employers reject it because it was diploma or because it was a two year course?

There was an air of defensiveness about the responses that the NAB had received, particularly on the question of the staff student ratio.

Discussing the issues raised by the drop in numbers of 18-year-olds in the 1980s Mr Wagner said it was not good enough to look at it in terms of coping with spare capacity in the institutions. This was simply an argument for preserving the institutions and staff jobs. It might be on the hidden agenda but this was not a good enough reason to put forward to the policy makers.

But there was a legitimate economic argument for making provisions for a non traditional groups of students, including those of 21 and over. If the economic forecasts that showed a slight growth in the economy in the next ten years were right then employers would not want to be fishing around in the smaller pool for skilled manpower.

College consortia condemned

by Olga Wojtas

Scottish Correspondent

The organizing secretary of Scotland's largest teaching union has condemned Strathclyde Region's moves to create consortia of schools and colleges as "a rationalization juggernaut".

Mr Fred Forrester of the Education Institute of Scotland said Strathclyde should call a halt to its plans and have a year of consultation.

Strathclyde has established 60 area curriculum planning groups of local educationists to produce proposals for implementing the Government's 16 to 18 Action Plan.

Mr Forrester told a union meeting this week that the groups received "detailed and strong guidance" from the council's educational administration. The whole idea of introducing consortia next academic session had been orchestrated by the administration and many regional councillors were totally unaware of the implications.

The plans would be presented to

councillors for the first time at a schools subcommittee this week and an education committee later this month, and the EIS Strathclyde regional executive has decided to lobby both meetings.

But Mr Frank Pignatelli, Strathclyde Region's assistant director of education, said councillors were not discussing the issues for the first time.

In November 1982, the council's education committee approved a document produced by council members and officers on post-compulsory education and training. The Government produced its action plan the following January, which followed the same broad principles as Strathclyde's document.

But Mr Forrester said there was nothing in the action plan requiring education authorities to introduce consortia arrangements in August and there was no indication that any of the other Scottish regional councils would be doing so.

"Strathclyde councillors should veto this bureaucratic nightmare," he said.

Natfhe to debate missiles motion

A demand for the removal of cruise and Pershing missiles from Britain is to be discussed by delegates to the annual conference of the college lecturers' conference of the college lecturers' union, which in 1983 became the first trade union to disaffiliate from the Campaign for Nuclear Disarmament.

A motion from the outer London region of the National Association of Teachers in Further and Higher Education to its conference in Birmingham next month, condemns the missiles' deployment as a "dangerous leap in the arms race, endangering peace in Europe."

Natfhe's 1984 conference voted to affiliate to CND but the decision was rescinded last year following a consultation exercise among the union's 76,000 members.

Economist leaves college £1.5m

Trinity College, Cambridge - already the richest - is reported to have received a £1.5m bequest from Mr Piero Sraffa, an Italian-born economist, who was a fellow there for more than 40 years.

Mr Sraffa, a brilliant innovative theorist and a protégé of Keynes, became a reader in economics at the university and died last year at the age of 85. College officials have been negotiating over his estate for several months.

He went to Cambridge in 1927 from Turin University to escape the restrictions of fascist rule. In the 1930s he embarked on his life's work, a monumental edition of the collected writings of the classical economist, David Ricardo, which ran to 11 volumes, the last appearing in 1973.

He was a close friend of the Marxist thinker and founder of the Italian communist party, Antonio Gramsci, and first came to note in 1926 after an article in the *Economic Journal* which paved the way for modern theories on the behaviour of the firm.

In his bequest Mr Sraffa has also left £1,000 to be divided among the porters and waiters at the college's high table and £500 for the librarian at the university's Marshall economics library.



A pair of star-cross'd lovers - David Watts and Wendy Perkins will play Romeo and Juliet in the Keele University Drama Society's open air production of Shakespeare's great love story, to be presented in June in the courtyard of the historic Clock House.

Publishers in move to counter effect of cuts

University and college book publishers see the setting up of a good relationship with the Manpower Services Commission and the Open Tech as a priority.

The aim is to ensure that the publishers participate in current developments and is part of a campaign against any moves by government organizations that "threaten a free, independent and private educational publishing industry".

This is part of a five-year plan drawn up by the University, College and Professional Publishers' Council of The Publishers' Association aimed at stimulating sales in an area badly hit by the recession and government cuts.

The UCP is also concerned about the availability of books to students and institutions through some outlets. It wants to monitor the supply and distribution of academic books and is considering building up a list of suppliers to institutions of further and higher education.

The Council is pleased with the results of its campaign against cuts in library spending, launched last year, which, it says, is already having measurable results. As part of the effort, it is to produce two or three national studies on library book spend-

ing each year, supplemented by regional studies.

There will also be a major report each year drawing attention to the importance of books and journals to scholarship and to the economy. Books in Further and Continuing Education is suggested as the subject for the 1984/85 report and *Books for Higher Education* will be considered in 1986/87.

The defence of copyright in educational institutions is certain to remain a major issue, the council says. Five years ago it was thought that by now a workable system of control and payment would have been established and it was imperative that such a system was in existence by 1988.

The council's plan picks out further and continuing education as a clearly identifiable growth area over the next five years. "Our knowledge of this sector remains sketchy," the council says, "and the investigation of this market should make reasonable and regular calls on our research and publication budgets".

Over the next five years the council is pledged to continue its lobbying of the media, parliament, local authorities and teacher organizations on behalf of resources for academic books.

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WIGGINS TEAPE

The deadline for responses to the University Grants Committee's 'great debate' was the end of March. *The THES* reports on more submissions.

Arts need a vote of confidence, says BA

by Sandra Hempel

A demand for the reassertion of the value and importance of the arts is made by British Academy president Professor Owen Chadwick in the academy's response.

He warns of low morale in arts faculties and says there is a widespread belief "however erroneous that the Department of Education wishes to weaken them and, in an extreme form of belief, to demolish them".

The academy says that low morale is partly because of the large provision of extra posts in science and information technology in the new blood scheme compared with those in the humanities and social sciences. It also claims that Sir Keith Joseph's "implied strong defence of the humanities went unobserved when he said it was important to ensure that across higher education the full range of opportunity continued to be provided".

"We think this decline of morale a pity," the academy says. "We believe that the Government has no intention

of running down the arts faculties and that it values the high standards of research and teaching to be found in them."

But there was a discrepancy between what the Government intends and what Government is believed to intend. "What is now needed is a reassertion of the value and importance of arts subjects".

The academy warns the UGC against appearing to be the agent of the Government. "We are not quite happy with the phrase in your letter about universities being under the control of DES and UGC", it says. The BA complains that recently the UGC seems to have had less influence than before on the size of the universities' grant and that the DES has taken more interest in the way the UGC distributes the money.

The academy is concerned about the new blood scheme. The provision for the humanities and social sciences is lamentably small, it says, and the



Professor Chadwick: morale warning emphasis on innovation "may tend to encourage research into marginal subjects instead of reinforcing the central core of a discipline".

The scheme was an inadequate substitute for planning by individual universities and departments and any future schemes should be without the "institutional discrimination" between science and the humanities that marked the present scheme.

On research, the academy says it attaches the highest importance to the provision of continued and balanced funding for research in the humanities. This funding "must include provision for first class libraries and for foreign travel for research". The present level of support for this was not high and "we should be very sorry indeed if the provision of libraries and of facilities for travel were allowed to slip even the smallest distance further".

The academy, therefore, welcomes the UGC's recommendation to universities to maintain or even increase spending on books but says that in the present circumstances this was probably much harder for universities to do than was often appreciated.

Scots disagree on merger

by Olga Wojtas
Scottish Correspondent

The UGC has received views on mergers from the University of Edinburgh and Dundee on the one hand and Dundee and St Andrews on the other.

1967, have made it clear that mergers are unlikely to proceed. Dundee and St Andrews in institutional size do not lead to improved efficiency.

St Andrews says it is an arrangement enabling it to move between universities. This could not be achieved planning over several years participating universities common course structure.

Mr Stirling, which is involved in merger proposals, says that financial help is its ability to expand its business management, technology and computing studies is severely limited.

But it is investigating "co-operation" to encourage combination of subjects. It is interested in having a large and technological campus. There has been speculation that Dundee could be a danger to the UGC's efforts to achieve a more unified system.

The UGC must take account of universities' differing local conditions, particularly those of universities "one from others which have a cultural focus for the local community and encourage a collaborative relationship with industry and encourage a through science park".

The university also upholds student numbers are to be nationally, the UGC should reallocate a relatively small number of students from some of the larger institutions to some of the smaller ones.

The UGC should evaluate its own role through a regular audit, it advises, not necessarily by committee members. It would choose a review panel, minority chosen from members used by the university body.

Mr Frank Murphy, a head porter at Bedford College, is in the higher income band for manual workers, earning £111 gross with overtime for Saturday working of an extra £12 every other week.

A single man, his deductions are greater, with net income of about £75 a week, and no benefits. He comments: "I can just about manage but I find my standard of living has dropped back every year."

Mr Murphy says he was forced to give up the idea of evening classes because he could not afford the fees. Scathing in his criticism of the employers for perpetuating low pay in the universities, he says: "There always seems to be the money for unnecessary things but when it comes to our wages they plead poverty."

A case in point is the £5,000 set aside for a visit to the college by Her Majesty the Queen Mother this summer. "This is the annual wage of a cleaner yet we have seen jobs lost and people are having to do extra work."

Correction

Hill University has only agreed to pay compensation on the current scale to academic staff who seek early retirement before the end of its present restructuring period, and not to all staff who apply in the next two years as stated in *The THES* last week.

The university council has decided that any staff who seek early retirement before September 30 but are refused, but whom subsequently it is decided it is in the managerial interest to release, will receive compensation on existing terms.

Ian Wrigglesworth
The author is Social Secretary of the University of Edinburgh.

City merger will happen, says ILEA

by Karen Gold

Inner London's higher education planners remain confident that the City University and City of London Polytechnic will eventually merge, despite the former's opposition.

The Inner London Education Authority's further and higher education subcommittee had to amend its planned resolution to set up a feasibility study for the merger when it met this week after it received a letter from Dr Raoul Franklin, the university vice-chancellor, declining the offer.

But the subcommittee did agree all the other major proposals in the ILEA education officer's report, including the merger of Thames Polytechnic and Avery Hill College; moves towards the establishment of a permanent inner London higher education planning board; the amalgamation of London art colleges into a college of art and design; and the redistribution in principle of major amounts of higher education between the capital's

polytechnics.

Dr Franklin's letter, sent after the university senate and council rejected the proposed feasibility study, said that as well as wanting to see national policy on transitory mergers develop before committing itself, the university had three reservations about the ILEA education officer's report recommending the merger.

These were that the authority had overstated the academic advantages of merging and missed the disadvantages; that the status of the new institution was not clear; and that the report's recommendations that particular departments should merge had unacceptable implications for the internal organization and operation of the resulting institution.

The subcommittee's amended resolution recognized the "substantial educational benefits" to be gained from a merger and asked for a meeting between representatives of the university council, the polytechnic and the authority.

Mr Philip Hunter, the ILEA's deputy education officer, said that all three points appeared to be based on misunderstandings. "My own view is that the City University amalgamation will happen eventually," he said. "I think the academic case is strong enough, and I think that it is understood by HM Inspectors, by the polytechnic, by our inspectors and by us. I think it will happen in the end."

If it did not, he said, the future of City Polytechnic and other possible arrangements would be discussed by the higher education strategy section. The subcommittee agreed a further report should be written setting out the terms of reference and membership of the section proposed in the education officer's paper, which would become responsible for planning in inner London, with advice on subject and geographical provision from subsections.

Professor David Smith, leader of the Conservative opposition on the ILEA, said that he welcomed the board proposal, but it should not become an

obstacle to change. "We have to have something that is prepared and has the power to make unpleasant decisions," he said.

The decision to establish a steering group for the merger of Thames Polytechnic and Avery Hill College was taken after protests from the chairman of Avery Hill governors, Mr Fred Styles, and two Labour ILEA councillors. All other Labour and Tory members voted for it.

Mr Styles told the subcommittee that the merger would destroy Avery Hill's special relationship with the authority, it was to happen too quickly and the disruption of merger might then be repeated if Goldsmith's College was brought in as well.

But Mr Neil Fletcher, chairman of the subcommittee, said that there was no question of one institution swallowing up the other. Goldsmith's negotiations with London University would be decided in June this year and the September 1985 deadline for the new institution could be flexible.

ILEA fears 'poaching'

by David Jobbins

Objections to the UGC exercise being limited to the university sector have been lodged by the Inner London Education Authority, which administers five polytechnics.

The authority quotes a National Advisory Body forecast that the average university student is funded at twice the rate of his or her public sector counterpart and that this disparity is likely to worsen rapidly.

"The risk of ILEA institutions which successfully serve local needs suffering as a result of poaching by universities under pressure is a matter of concern to ILEA," it says.

"The prediction of part-time students and mature student demand is notoriously unreliable - our considerable experience in this field suggests that Department of Education and Science data is highly questionable."

The ILEA welcomes a more open approach by the UGC if this means increased representation on its committees. But it is cautious about an "over-arching" body for all higher education, maintaining it would be necessary to define the role of ILEA and to safeguard their need to respond to local needs.

"Overall central government policy is inevitable but restrictive controls and interference at local level must be resisted," it says.

The ILEA attempts to set the UGC's exercise in the context of its own review of advanced further education in London.

Last month, Parliament heard one of its best debates on higher and further education for many years. The debate was notable in several ways. First, the debate was very constructive. It was conducted with a minimum of political rancour, and with a good deal of courtesy. Indeed, there was the unusual sight of the Government not only listening, to, but actually inviting, the views of the Opposition. Contrary to the impression given by radio, Parliament showed it can have a debate without heckling, jeering or constant interruption.

If you are thinking that such a debate seems unlikely for the House of Commons, you are right. The debate took place in the Lords and was representative of the higher and more civilized standard of debate that they are able to achieve.

The quality of the Lords' debate owed much to the presence of many speakers who have extensive, first-hand knowledge of further and higher education. In our own ranks from the Alliance benches Lord Flowers, Lord Perry and Lord Grimond all spoke with voices of authority and experience which, of necessity, is often absent from some of our debates in the House of Commons. MPs' commitments to their constituents, their party and their other parliamentary activities

LSE argues for 'professionalism'

by Ngagio Creguer

The London School of Economics argues that in a civilized society there is no conflict between academic excellence and vocational or practical usefulness.

Even in professional subjects what is required is not narrow expertise but a "humanism professionalism". This is how vocational relevance must be understood, if there are to be no undesirable restrictions on scholarship and university education.

A 5 per cent cut in real terms "would push a first-rate institution like LSE across the threshold which

separates an internationally competitive college from a run-of-the-mill place of higher education."

Virtually all academics at LSE also felt that the pressures of the last few years had created conditions increasingly adverse to the dynamism of the research effort.

On the role of the University Grants Committee, "the view has been expressed that not much would be lost if the UGC were disbanded". But "short of that radical change" it would be desirable if the influence of universities were seen more clearly in the appointment and composition

of members, and structure of secretariat.

An important element of the buffer role of the UGC was the quinquennial system. "It forced the UGC to assess what was happening in universities, it enabled the UGC to consider medium-term planning, it made government dependent on UGC advice, and it guaranteed the relative autonomy of both UGC and universities..."

"Once the UGC had lost the strategic function which required it to serve both sides... UGC was bound to appear weak and tied to one side rather than the other."

Hull stresses importance of level funding

After the drastic restructuring of the previous three years, the importance of level funding, at least in the short term, "cannot be emphasized too strongly", Hull University has told the UGC.

"We note with dismay that Circular Letter 28/84 shows that level funding for 1984/85 has already been abandoned", Hull adds. "The UGC has itself drawn attention to the risk of disinvestment and disorder. We have avoided disorder: the disinvestment of reduced scale remain a deep concern."

On reducing the resource per student, Hull says that a real reduction of over 6 per cent and 12 per cent over six years "might in itself seem manageable, causing a deterioration in the student staff ratio of between 0.5 and 1.0; but this could not be achieved in practice without severe, probably

fundamental, damage coming as it would on top of the much greater reduction of 20 per cent effected over three years."

On collaboration with other universities, Hull says that collaboration in research is already well-established and that collaboration in teaching is desirable if it involves an enrichment of normal academic resources "but as means of filling gaps created by cuts in resources it cannot be more than marginally effective".

It is in favour in principle of collaboration between neighbouring public sector institutions which, Hull says, might begin with a joint examination of the educational, social and economic roles of the institutions within their region.

But there are benefits both to students and to the community in general

in some of the differences in function and style which exist between different types of institution and "forced convergence is undesirable".

Compulsory mergers of institutions "as a cover for drastic contraction would be dysfunctional in the short and medium-term" and any resources derived from mergers must be retained within the institutions as a whole of within the system as a whole.

On the shift towards technological, scientific, engineering and other vocational forms of study, the university says that no student is worse off than one with an unwanted vocational skill.

On the role of the UGC itself, Hull says that as university government has become more open, so the UGC decision process needs similarly to be more open and more open to challenge.

In the Commons, there are 411 peers in the upper chamber. It is a daunting indictment of our electoral system that our elected representatives can be less representative of popular opinion than our elected representatives in the Lords.

We do not claim that popular representation would be a panacea to all our problems. It would certainly be more than eliminated some of the absurdities of our electoral system. It should also lead to more effective government. It would lead to a more democratic elected Government and to a more effective elected Government.

Just as the Lords needs to be reformed to make it more representative, so too, of course, should the Commons be reformed to make it more representative as well. It is particularly ironic that the Lords are, in some respects, more representative of popular opinion than the Commons. Whereas there are only 23 Alliance MPs to represent

Party Line

A higher level of debate

are often too great to enable them to have the depth of experience and authority on subjects that many peers have.

Recently the Lords have proved that they are not just an elderly and polite debating society. They have also displayed an unusual willingness to flex their political muscle at the expense of the Government which has faced a series of defeats in the Lords on the Telecom Bill, the Housing (Building and Control) Bill and most recently on the Education (Grants and Awards) Bill. Such defeats would be unthinkable in the Commons where the Government's massive majority of 144, although based on only 42 per cent of the popular vote, ensures that it will not be effectively opposed.

Of course, the readiness of the Lords to defeat the Government is full of irony. The Labour party, which is pledged to abolish the Lords, now sees it as its main hope of defeating or amending the Gov-

Where the claim turns to reality

Negotiators representing university manual workers will today make a renewed attempt to force employers to increase their 3 per cent offer.

But the outcome is likely to be small consolation to John King, a library attendant at Senate House, and thousands of cleaners, catering staff and porters like him.

Mr King, married with four children, earns £90 a week, and takes home less than £70 after deductions. "An increase of the order being discussed would in effect be a pay cut - the Government has said rents must increase and then there are rates and fares. Whatever we get will be much less than inflation, but the increase in costs for my family on items such as housing, transport and food is much higher than the inflation rate."

The employers last week angered union negotiators by pointing to the family income supplement and other benefits available to families on low pay. Mr King claims FIS, which together with rent and rate rebates make up a large part of his family's income, "I do not think we should have to rely on benefits as part of our wages. There is no denying it is a struggle."

The unions are also angered by the refusal of the vice chancellors to disclose their salaries. Mr King adds: "It is very annoying that some people earning so much can tell others the wage bill is only going to be 3 per cent when 3 per cent of their money can be £20 a week while ours is only a couple."

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A single man, his deductions are greater, with net income of about £75 a week, and no benefits. He comments: "I can just about manage but I find my standard of living has dropped back every year."

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A case in point is the £5,000 set aside for a visit to the college by Her Majesty the Queen Mother this summer. "This is the annual wage of a cleaner yet we have seen jobs lost and people are having to do extra work."

The White Paper proposed the transfer of responsibility and funding for a quarter of all non advanced further education from the local authorities to the MSC. It criticized the authorities for failing to meet the needs of industry and employers.

Information technology transfusion

Another 46½ information technology posts have been allocated to the universities by the University Grants Committee as part of the three year programme which began last year to boost the training of qualified staff and expand research in this area. A full breakdown of the allocation follows.

● In last week's "new blood" table, some of the figures for Edinburgh University were transposed. Their total of 13 included 3 in social science, and not education as suggested.

Gap between university and industry 'widening'

by John O'Leary

The gap between the skills possessed by university graduates and those needed to fit into industry seems to be growing wider, Mr Kenneth Durham, chairman of Unilever, told a conference in Cambridge last week.

He told a meeting on a future role for higher education that three quarters of PhD students were not fitted to industrial research and had to be retrained to do something useful. Cambridge engineers, for example, could not be near plants, in case they hurt themselves. They were very good mathematicians.

Mr Durham said suspicion of and apathy towards industry still ran very deep throughout the education system, despite some improvement in attitudes during recent years.

"There has developed a tradition in society and education that is for the maintenance of the status quo, the securing of stability," he said. "The promotion of this tradition drains prestige from innovation to preservation, from novelty to antiquity. It is the death knell to constructive academic-business relationships."

He accepted that there were other demands on the education system. But said his concern was that the balance between various demands did not reflect the importance of industry.

Mr Durham added: "It doesn't seem particularly sensible to me to stress the importance of higher education in developing all the other qualities at the



Kenneth Durham: concerned

expense of the very economic engine that must provide the material resources by which all the other things can be enjoyed."

He said that industry must bear its share of the blame for not making a clear statement of its needs from education. The signals sent to academic were unlikely to impress either the young student or his tutor or adviser.

There was an apparent lack of interest in education by those right at the top of business. Yet there has never been a time when British industry needed a bigger input from the great multidisciplinary institutions of higher education.

Lords warn on training

Colleges of further education in run-down industrial areas could be driven out of business as a result of the White Paper *Training for Jobs*, Lord Prys-Davies told the House of Lords last week during a debate on vocational training.

He said the powers proposed for the Manpower Services Commission would lead to a concentration of further education facilities within easy reach of modern industry.

"By the use of these powers the MSC will support those courses it wishes to advance and will insist on provision it wants to promote. But as central funding to local education authorities will be reduced it is likely that many courses currently available will fall by the wayside," Lord Prys-Davies said.

The White Paper proposed the transfer of responsibility and funding for a quarter of all non advanced further education from the local authorities to the MSC. It criticized the authorities for failing to meet the needs of industry and employers.

Lord Cledwyn of Penrhos said the White Paper represented a grim and frightening development in concentrating more power in the hands of the Civil Service.

Lord Kilmaurck deplored the lack of consultation and said that if the MSC was to become the paymaster of one quarter of NAFE, then there should be a greater educational presence on its main board.



Facing the gangsters in gowns

The 1984/85 pay round in universities is drawing to a climax and based upon the employers' attitudes to their manual and ancillary staff the ability of the trade unions will be sorely stretched to maintain any semblance of industrial relations.

While technicians have a much longer arrangement for determining pay at national level, the clerical and certain related staffs, plus the manual and ancillary staffs, have yet to reach their tenth anniversary.

Just how serious are the employers in reaching a national determination on pay and certain conditions of service when judged against the treatment of manual workers in the last 12 months? During that period the trade unions experienced a great deal of difficulty in reaching agreement on very minor adjustments in the grading structure. After the event, in which the unions compromised on every point at issue, it is discovered that the employers' side chairman has treated certain of his own manual staff more favourably than he was prepared to agree on a national consortium basis.

The unions are justified in asking whether the employers' side chairman is a true custodian of national agreements, or is he a plant of Government to break up national negotiating committees that, so far, can chalk up - albeit very minor - successes in preventing further erosions of living standards that have already been affected? GCHQ last month Universities next?

Is it wrong for manual and ancillary staff, whose pay is the lowest of any negotiating committee in universities and whose hours are longest, to seek a remedy on both issues? The employers were once described to a meeting of employees as "gangsters in gowns".

For academic staff to deny some adjustment of hours for manual and ancillary staff, at least to an extent that would provide some rationale with other grades on the grounds that they cannot afford it, is nothing short of hypocrisy. Is it wrong that the employees should, poor as their living standards may be, seek to ensure that those standards are not further eroded and is that denial by the "gangsters in gowns" also not hypocritical?

Just by way of change let the gangsters change into modern-day Robin Hoods (union members at Nottingham will not see this as a pun against the chairman of the employers' side) and this year accept for themselves the figure which 3 per cent increase would give manual and ancillary staff and give to the manual and ancillary staff the equivalent of 3 per cent of vice chancellor's pay; even this gesture would fall short of returning to the relative position of manual to academic staff in 1977.

In response to a most recent claim, the unions were told that the employers have a responsibility to contribute to reducing inflation by making an offer of 3 per cent, roughly £2.85 a week for a full-time employee. To add insult to injury they stated in the most categorical terms that any low-paid employee can always seek the protection provided by the welfare state. When will they ever learn!

Before this group return to the negotiating chamber the academics and technicians will have met the employers on their claims. I trust the employers' offer is not as insulting as the offer described above.

Harold E. Wild
The author is national secretary of the National Union of Public Employees.

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Institution	Research (IT1)	Teaching (IT2)	Total
Cambridge	2 (4)	2 (2)	4 (6)
City	1 (1)	1 (1)	2 (2)
Durham	1 (1)	1 (1)	2 (2)
Essex	2 (2)	1 (1)	3 (3)
Keele	1 (1)	1 (1)	2 (2)
Kent	1 (1)	1 (1)	2 (2)
LONDON			
Bedford/Royal Holloway	1 (1)	1 (1)	2 (2)
Imperial College	3 (3)	1 (1)	4 (4)
Queen Mary College	2 (2)	1 (1)	3 (3)
University College	1 (1)	1 (1)	2 (2)
Loughborough	2 (2)	1 (1)	3 (3)
Manchester	2 (2)	1 (1)	3 (3)
UMIST	1 (1)	1 (1)	2 (2)
Newcastle	2 (2)	1 (1)	3 (3)
Oxford	3 (3)	1 (1)	4 (4)
Southampton	2 (2)	1 (1)	3 (3)
Sussex	1 (1)	1 (1)	2 (2)
Warwick	1 (1)	1 (1)	2 (2)
York	1 (1)	1 (1)	2 (2)
WALSLEY			
University College Cardiff	1 (1)	1 (1)	2 (2)
ULWIST			
SCOTLAND			
Edinburgh	4 (4)	1 (1)	5 (5)
Glasgow	1 (1)	1 (1)	2 (2)
Heriot-Watt	1 (1)	1 (1)	2 (2)
Stirling	1 (1)	1 (1)	2 (2)
Open University	1 (1)	1 (1)	2 (2)

(Last year's posts in brackets)

WORLDWIDE

The association's chairman is determined it will. "We are a fairly resourceful organization. Selfbacks this have happened before and have always been weathered, but shall he put back in our work a long way."

Putting on the pay pressure

David Jobbins looks at this year's wage claims

Salaries in universities and public sector colleges are slipping behind once again and the inevitable pressures which led to the Clegg review - which acted as a safety valve after years of pay restraint - are again building up. External relativities and internal anomalies have suffered in the face of successive years of pay policy by cash limit.

Now more than ever the employers, both in the universities and in local government, feel less able to find the resources to solve the problems either through collective bargaining or through arbitration or some other form of review.

The unions' case against cash limits and their effects is simple: Houghton, Clegg and "pseudo Clegg" awards objectively placed lecturers in the pay league table, only to be displaced as rapidly as the following pay round.

Relative salaries for 1980 should be the same in 1984, adjusted for inflation, the unions argue.

While some employers may generally accept the logic of this case (the vice chancellors have said so publicly in past pay rounds) they say they simply have not got the spare resources to meet the pay rises needed.

The amounts involved are large enough to cause apoplexy in Number 10. A polytechnic or college lecturer at the top of the lecturer scale receiving £11,295 in 1980 would need a rise of £15,417 in the 1984 pay award just to meet the estimated increase in inflation. Instead, the current 3 per cent offer, rejected by the unions, would mean a salary from April of £13,846, a shortfall of £1,571.

The sort of increases needed to restore living standards to their 1980 levels are, the employers say simply beyond their powers, faced as they are with cash limits, tight cuts on rate levels which will restrict their power to "top up" increases beyond 3 per cent, and the extra 1.05 per cent super-annuation contribution.

If inflation has raced ahead of pay increases for college lecturers, so have earnings elsewhere. While the retail price index is estimated to rise by 36.5 per cent over the period, average earnings will have gone up by 48 per cent, according to the submission from the teacher union to the Burnham further education committee.

This would imply that to keep pace with the general movement in earnings the senior lecturer at the top of the

scale would need to reach £16,716 after April pay settlement.

The Association of Polytechnic Teachers, goes further in its claim and argues that the increase in average earnings should be adjusted to take account of the steeper increases for professional and managerial staff. The top of the scale SL's salary after April should instead be £17,074 - needing an increase of no less than 27 per cent, it says.

Although the public sector unions have concentrated on a simple percentage claim to permit concentration on their sole structural demand - automatic transfer from the Lecturer 1 to the Lecturer 2 scale, they are insisting that the final settlement should not only maintain living standards but move towards acceptable external relativities - levels comparable with other groups.

The only one cited in the claim is with the universities and the unions say that between 5 and 8 per cent, according to achieve parity.

The top of the senior lecturer grade in the public sector is generally regarded as the equivalent of the top of the lecturer scale in the universities, currently carrying a salary of £15,125. The Association of University Teachers says it is generally accepted that the members' higher pay should reflect the greater amount of higher degree work undertaken in comparison with advanced further education lecturers and the contractual obligation to undertake research. This advantage has been narrowed over the years, from a lead of 17.9 per cent or £1,753 in April 1979 to only 5.1 per cent or £682 now.

Outside education the universities' traditional peg for comparison is civil service, the only other substantial group of employees containing the same wide spread of specialists which incidentally recruits from the same pool of graduates.

In the civil service the grade regarded as equivalent to the lecturer scale is the principal secretary. A

principal and a university lecturer at the top of their scales were effectively level-pugging in 1979, with the civil servant having a slight 2 per cent advantage.

But despite cash limits which have arguably hit the civil service almost as hard as the universities, that gap widened to an astonishing 18 per cent by 1983, with the principal's £16,656 well ahead of the university lecturer's £14,125.

In 1982 and 1983 the Government was persuaded to allow the universities extra money to help bridge the gap between the negotiated settlement and the award to university academics and the award to National Health Service staff payable to clinical academics. The effect was to widen substantially and swiftly the differential between clinical and non-clinical salaries, from a 2 per cent lead at professional level in 1979 to 20 per cent this year. Even to restore the differential to its 1981 level would need a 5 per cent rise.

The AUT says in its claim: "While we recognize that clinical responsibility does justify a differential, this does not justify a differential which increases in percentage terms year by year."

But the union expresses its continued support for the longstanding agreement that whatever emerges from the review body for NHS doctors and dentists should apply also to the university clinicians.

If by some miracle or a serious lapse on the part of the employers, college lecturers' salaries rose in line with white collar earnings to restore the 1980 comparability, the salary of the university lecturer at the top of the scale would have to increase to £20,128 to restore the 1979 lead over the further education service. Instead, with little more than 3 per cent likely to be on offer, much less than £15,000 is the probable outcome.

And then there are the structural issues. Automatic transfer from the bottom scale is a longstanding demand from the public sector unions meeting equally longstanding resistance from the employers.

"All data shows that the Lecturer 1 scale does not operate as a scale at all for large numbers of teachers who are appointed to the top of the scale," the unions say. "For many others it is severely truncated, they arrive at the top in a small number of years and then remain on that point for a great many more while the lowest points have little practical application at all."

A joint survey has shown that 40 per cent of L1s join the scale on the top two points of a 15-point scale, while less than 1 per cent are appointed to the bottom three points and only just over 30 per cent to the bottom 10.

The reason little or no use is made of the lower ends of the 16-point L1 scale is that most newly-recruited lecturers have qualifications or experience leading to higher starting salaries.

Recruits with a degree or equivalent start three points up the scale (four unless it is a third); those with more than three years' full-time study after 18 receive an extra increment for each year; while there is another nudge up the ladder if certain teacher education qualifications are held.

So in today's competitive world a graduate with a first or second, a masters and teaching certificate would be unable to enter the profession at less than the sixth point on the scale. And authorities have the discretion to offer as many incremental points as they consider fit (subject to reaching the top of the scale) for relevant educational, industrial or professional experience, enabling them to offer "competitive" starting salaries to lecturers without such formal qualifications but with practical background knowledge.

This is one of the areas which many suspect will be on the employers' shopping list with longer teaching hours and academic years.

Promotion blockages are not unique to the public sector: AUT negotiators want to end what they regard as a damaging influence on morale by introducing a single salary scale with an efficiency bar at the chaperone point between the old lecturer and senior

lecturer scales. The AUT's general secretary, Diana Warwick, "There is anxiety and anger among about the continued morale. Over the past few years the union's case for pay has doubled while the public sector has fallen by half. The union's case for pay has doubled while the public sector has fallen by half. The union's case for pay has doubled while the public sector has fallen by half."

Key negotiations for the union are taking place this week for the National Union of Students. Wednesday, the technician day and manual workers union.

Unions held in the public sector are under 3 per cent as an adequate response to the odds seem heavily against a significantly legal the short term.

While the offer to college lecturers may seem to be a concession for local government workers, the college making clear that this is not an offer to Scottish schools or other benchmarks for elsewhere.

Significantly the Scottish Education Department is having to meet the extra cost of a 1.05 per cent increase in the 1984 pay award. The union is not for any further towards high English schoolteachers and their colleagues.

The vice chancellors have about the effects on jobs. Excess of 3 per cent will be entirely altruistic.

University services are working at a bare minimum. Job losses caused by pressure to cut costs are not always obvious to the public.

With a trade union movement and university of 1983 seems to offer the opportunity to keep the 3 per cent settlements. The union would then higher education many more times can they be

Peter H. Mann analyses undergraduate spending on books

Reading between the lines



with a survey of undergraduate income and spending carried out by the DES by the Office of Population Censuses and Surveys in the 1974/75 academic year, "the value of the full grant in 1982/83 is 98 per cent of the 1974/75 grant."

It does, therefore, seem reasonable to conclude that student grants have kept up fairly well with the general costs of living over the past 10 or 12 years. But student living is not the same as ordinary family living, where few households would expect to spend over 10 per cent of their income on books and academic equipment.

Have book prices, then, risen more or less than the general cost of living? A comparison of the book price index compiled by *The Bookseller* would put the average price of books in 1971 at £3.39 and at £13.06 in mid-1983, an increase of nearly fourfold. An index of academic book prices begun at the Centre for Library and Information Management at Loughborough University in 1974 has a multiplier of 3.2 to the end of 1982, which would compare with a multiplier of 2.84 for the Retail Price Index.

No one in the book trade would doubt for a moment that books in general have increased in price more than many other items and certainly academic books have been a category which has seen many quite steep price rises. If we accept that books have become more expensive (in real terms) the relative reduction in student purchasing could be regarded as a very serious matter.

But this takes us back to the initial question with which this article began. Do students really need to buy books? If universities can afford to spend all of 2.2 per cent of their total recurrent expenditure in 1982/83 on books, periodicals and binding, then do students need to buy any books at all?

The study of *Book-keeping in Higher Education* by Rachel Evans and Jack Meadows was carried out in 70 universities, polytechnics and colleges of higher education where there are campus bookshops, with questionnaires sent to groups of academic staff, administrators, librarians, booksellers and students. This was followed up by structured interviews in selected institutions. Evans and Meadows concluded that the role of the campus bookshop is not always well defined and that much could be done, without large financial investment, to improve communications between the bookshops and the institutions.

They also quote the chairman of the Publishers' Association as having estimated that campus bookshop sales have dropped 20 per cent in the past three years. If this considerable drop is true, so, then the position of campus bookshops must be very serious indeed.

While the authors say that "if an academic institution wants an efficient book-purchasing service it must be prepared to contribute to the efficiency of it", only slightly more than half the responding institutions had a bookshop committee, only just over a third had "officially" laid down lines of communication between the institution and the bookshop.

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Pauline Stafford

Total history is more than kings, queens and all that

So history is to form a part of the core curriculum - or at least Sir Keith Joseph has pronounced it as his opinion that history "properly taught" has an essential role to play in the education of all pupils up to the age of 16. His statement has delighted historians.

In common with so many branches of the humanities, there has been something of a beleaguered feeling about the historical camp in recent years, made worse if not entirely created by the vicious cuts. The recent statement by the president of the Historical Association on the "Value and use of history today" is eloquent testimony to the defensive state of the humanities at a time when educational thinking is dominated by broad-and-butter questions.

But if Sir Keith's remarks have brought comfort they have also created dismay and fears. They have been linked with those of Hugh Thomas, "Mrs. Thatcher's time historian" according to Christopher Hill, calling for a more national history curriculum such, it is argued, as turns out the more patriotic French citizen.

The question of French comparisons, either in terms of content or end result, must unfortunately be left aside, though an equally plausible case could be made out to explain the apparent readiness of the French to take to the streets over any issue from lamb imports to student rights in terms of their history curriculum. What Christopher Hill and Hugh Thomas are both deeply aware of is that no call for more history can be made in the name of ideology, whether that ideology is of the right or left, at an overt or deeper level.

To call for the teaching of history must provoke the response "Whose history?" "What content?" Will it be to people, battles and Victorian values, as Hill suggests the right would wish? Or his own "real achievements of the English" - the great popular achievements of labourers, the tradition of freedom, the capacity to organize? Neither curriculum would be in any sense value free; Christopher Hill and Sir Keith Joseph would not agree in their definitions of the real achievements of the English.

Laying aside more puranoid fears and hopes, an overtly ideological history syllabus seems a remote possibility. The rewriting of history along the lines used by openly authoritarian regimes, total distortion and omission, appears unlikely. What people like Christopher Hill legitimately fear is the deeper level of ideology - the manipulation of history by the determination of its contents and thus its questions.

On this crucial question historians have been engaged for some time in a debate which will no doubt be given fresh urgency by recent developments. History cannot avoid being the vehicle through which culture and values are transmitted. Many advocates of a common curriculum favour its emphasis on our "common culture", seen as of special relevance to our multi-racial society.

But the very existence of that multi-racial society has thrown serious doubt on our common culture, is always a highly debatable issue. Should it include study of, say, the Caribbean and the Indian sub-continent? Is the history of kings, queens and nobles the story of the achievements of their forebears for 90 per cent of the British people? Is British as opposed to English history taught anyway? Any exclusive definition inevitably raises accusations that it is the dominant or the common culture which is being stressed.

If people speak and project their own identity in the past through history, any modern curriculum which seeks to meet their aspirations must encompass all social and ethnic groups, women and children as well as men, bottom people and top people. The need is for total history, one which seeks to avoid bias by breadth.

It is for historians now to reconcile the problems of achieving that aim with those others which they would consider crucial to the historical training: the critical attitude to documentation and sources; the feeling for development which comes only with the long time span; the ability to grasp the complexity and uniqueness of an event or situation; the respect for and understanding of that which is different and other in the past as well as the recognition of the links which tie us to it.

My fears of the threat of direct political intervention in this process of defining the content of history are limited. Whatever Sir Keith Joseph or Hugh Thomas might wish (and it may not be quite the nightmare of history as propaganda that some have suggested), change within the historical syllabus will come and has come, and I believe that which political intervention has only the most marginal impact.

Geoffrey Elton's inaugural lecture from the regius chair in Cambridge caused rather less stir, but was in many ways more interesting, not so much for what it advocated as for what it revealed. Elton called for the long sweep of English history, and especially for the history of English administration and political institutions, as the essential training for the future servants of the state seated in the Cambridge history school.

That type of history, which many now fear correctly is under threat, was indeed the training for rulers of the empire. It was developed by those drawn from such groups and spoke directly to their children. It is as much a product of its time and place as the dynastic histories produced for medieval kings by the churchmen at their courts. And its time and place are passing.

Perhaps they linger longer than elsewhere in Oxfordshire, but as the changes in the content and interests of history more generally indicate, elsewhere new pressures and demands are operating. Historians are responding to a new set of questions posed by their own society, by the burgeoning of amateur history and of popular history in the mass media.

A political decision on the curriculum cannot turn back changes in ideas, which is where the questions historians are asked originate. They are the products of many other factors acting on the historical tradition.

Much more dangerous are those political decisions which are curtailing the vigorous development of history as of all subjects by denying cash - for research, for new appointments, for maintaining the current situation let alone expanding it. These threats to silence history by rendering it defensive, by depriving it of opportunity for development are far more serious than the threat of curriculum interference.

Ironically, if Sir Keith Joseph's remarks help dispel the bunker mentality and restore a more aggressive and confident approach they may offer more succour than harm to some of the types of history to which he appears to object.

A classical setting for a new face

Ngao Crequer talks to Professor John Quayle, vice chancellor of Bath

"When you are constantly in contact like this you get the feeling that efficient management of resources is something of prime importance to a university as well."

I think in 1981 the University Grants Committee realized they had to take our cost effectiveness into account. We were operating at about 86 per cent of the unit cost for a university of our kind of mix and level of activity. In the 1970s the figure was about 70 per cent.

The other criteria he thinks were taken into account, which left Bath virtually unscathed, with an insignificant cut, were quality of intake, judged by A levels, and ability to attract outside research funds.

As he says, Bath could not lose. External income was some 12 per cent of total income, five, going by culture of intake.

The average University Central Council on Admissions score for 1983/84 at Bath is 12.5, A B C etc. The average grade required for the top school at Bath is 12.5 for the BSc in electrical engineering.

Next came chemical engineering and a degree in mathematics/computing science and statistics, for which the average is 13.7. The lowest average is 10.4 in social studies.

Professor Quayle brings a refreshing sensitivity to this situation of ever rising costs. "You begin to wonder what grades mean, whether the ability to score high levels is necessarily helping the people to benefit most."

"We do not intend to go on raising levels indefinitely. I think we are up against the limits now. We will just have to restrict the number of offers we make."



Professor Quayle: keeping a low profile

"At this rate of increase we will be up to a minimum of 2A and a B. Last year the average was 11.9, this year 12.5. It does mean that Bath students are an extremely bright bunch."

He also makes the point that most students will do a four year course, including one year's placement, and this shows their degree of motivation and concern to get jobs at the end of it.

Professor Quayle also has some firm views on sandwich education. Placements are harder to find both because of the recession, but also because there is more competition for the placements, as others recognize that sandwich is "a good thing".

As he explains, for a university to undertake sandwich training on a big scale, it is a highly complex job. There has to be a huge range of contact between staff and outside. These can only be built up over the years, and it is important to maintain a good record with sponsors.

Academic staff need a great deal of time just managing the system, and also supervising the work is crucial. "I think the UGC should watch very carefully how much sandwich training is done, because if we get into it we will all be chasing fish in a diminishing pool."

"We would welcome a national pool indicated which universities the UGC giving specialized funding for, to run training in given courses."

"We are a top class university doing a portion of sandwich training yet our funding is below average."

No which universities should give or start sandwich education? But here we are, we save to say that it would not be less if some 40 or so universities could run sandwich education and would be prepared to do so.

Professor Quayle said it might not "dog in the manger" argument, but that were limited, such points had to be made. He considers that the importance of the UGC question is in setting a public eye. "Some of these questions are so important that it does no more than around an interest, then it will have been worth our spending on it."

"Questions such as are we going to do 15-20 per cent drop? Is it going to be across universities and polytechnics?" "These are questions the public will ask, because it means in 10 years' time that they be desperately short of places in higher education, and now it is the public to think about it."

"You cannot turn the universities into like a tap. The Government must be aware of this large number of talented students who could not get into higher education within a year instead of finding ways of oversubscribing their targets, they were taking 10,000 extra students. The UGC planning."

And he thinks the case can be made for funding. "A 2 per cent a year loss is a prospect. You can make short term means to shortage but soon things will be in a state of emergency."

But Professor Quayle is supremely confident about the future for the universities. "The PABNBRF survey would seem to indicate that the position of campus bookshops must be very serious indeed."

While the authors say that "if an academic institution wants an efficient book-purchasing service it must be prepared to contribute to the efficiency of it", only slightly more than half the responding institutions had a bookshop committee, only just over a third had "officially" laid down lines of communication between the institution and the bookshop.

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The Great British University Miracle

As every reader of this paper is aware, higher education in this country is going through an economic crisis. For a private industry, an economic crisis means too few customers at profitable prices. For a nation it means raging inflation, crashing exchange rates or excessive unemployment. But for British higher education, and more especially for university education, an economic crisis is a crisis of public funding. The total cost of our activity includes teaching, administration, buildings and the value of production foregone by students in process. Of this, in the United Kingdom, no less than two thirds are typically met from public funds in one way or another, a higher figure than in any other non-Communist industrialized country in the world. Whenever total public expenditure is frozen, we are frozen, or worse.

Is there any other case than economic for a radical rethink about universities into the 1990s? Many people would say that there is a case for radically rethinking the content, elitism, subject orientation, specialization, entry system and other such. On these matters our universities have served our culture at its best and at its worst. Our academic standards are outstanding; we are bad at mass-producing motor cars. But the issues surrounding these kinds of important questions say little or nothing about total student numbers or the comparative economic efficiency of the university system as a whole.

But it remains the case that the Government, via the University Grants Committee (whose collaboration, collusion, or resistance is impossible for the outsider to elaborate), whatever it says, has by a series of actions continued to contrive the crisis. It has encouraged all the best professors with huge bribes to depart to the private sector. It has produced a set of cooked demographic projections designed to show that "demand" for student places in the long run is going to fall, when the opposite is almost certainly the case. It has induced the UGC to send round a questionnaire called "Higher Education into the 1990s" which treats these cooked statistics as a planning parameter. Finally, and most recently, the Department of Education and Science briefed its unfortunate spokesman in the House of Lords to give information on the economic return to higher education which (see below) also appears to be cooked. Only in this country would we find a spending department trying to

play down the case for one of its most important activities!

In this article I shall, rightly or wrongly, treat higher education as an economic activity comparable with any other economic activity. I concentrate on the UGC sector, not because it is necessarily more important than the non-UGC sector, but because it is the sector I know and because it is statistically more coherent. I reach the following conclusions:

● the so-called "Robbins expansion" was remarkably efficient and effective, and represents an outstanding British economic success in an era when such were hard to find;

● the university sector differs markedly from the public sector as a whole, in that compared with the whole economy its real costs per unit of output rather than rising, have tended to fall;

● this fall in input relative to output occurred when output was rising, so that, however vulnerable to public expenditure restraint may be our national allocation of inputs, there is no case whatsoever for cutting our output;

● the economic return to the nation from university education is so high, that there is in fact an overwhelming case for a new massive expansion, for in effect, a "new Robbins";

● after adjusting for quality we appear to be comparatively more efficient in higher education than any other country in the world, consequently there is also a massive case for looking forward to a future when this industry is an increasingly important export industry; in short we should be doing everything we can to encourage the maximum number of foreign students of good standard, who can pay full fees plus a profit, thereby adding to the resources of the domestic industry;

● in order to avoid the Government's persistent attempts to sabotage this priceless national asset, it is desirable that, to further the ends of expansion, the universities should develop a financial system which greatly increases their freedom of action, while subject to proper incentives to serve the public interest.

Much of the evidence for the Great British University Economic Miracle has been sitting in Government and UGC statistical publications for some time, but needs to be said, neither the voice of the UGC, nor the voice of the Government, nor the voice of the universities and principals have thought to undertake the relatively simple task of dividing one lot of numbers by another. Some of the remaining evidence (see tables) is

available in the results of research undertaken by myself, commissioned and paid for by the DES.

One reason for the general ignorance of the true situation is that most people believe that, unlike coal or cars, the output of "service" industries, and especially that of public sector services, is intangible and unmeasurable. To the extent that anything is measured at all, it is input rather than output. Not knowing how to measure crime, prevented, we measure numbers of policemen employed. In place of garbage we measure garbage collectors. In place of illnesses cured, we measure doctors, nurses, hospitals and porters. And in place of pupils educated, we measure numbers of teachers. In some parts of the public sector, eg defence or the Queen, the conceptual problems of measuring output may be permanently insuperable. In other sectors, eg health, they are not insuperable, but for no good reason the necessary data are not collated.

In the case of university education, however, there already exists a relatively unambiguous statistical measure (certainly less ambiguous than those used in the motor industry) which has been regularly collated and published for some years. This is the number of degrees of various kinds awarded annually. Since there is absolutely no evidence that examining standards have fallen in the past decade, it is difficult to argue that in the UK this statistic measures anything other than what it is: the universities' achievement, namely a *certified* increase in the learning embodied in the brains of the pupils. I therefore place great emphasis on this statistic, giving both crude results based on total "qualifications" obtained annually, and also results in which the different kinds of degrees are given plausible weights (eg 3:2 for honours v. ordinary etc); it will be seen that within reason the choice of weights does not make much difference). As a way to those who believe that it is the "educational experience" that counts, rather than "mere exam performance", I also give results based on numbers of students, weighting, where appropriate, part-time students as half a unit.

Table 1 tells the story. In the decade leading up to the "cuts", weighted student numbers rose by nearly 2.25 per cent per annum while staff grew by no more than 1.25 per cent per annum. Weighted degrees and diplomas awarded, my measure of output, rose by nearly 4 per cent per annum. Since there is no evidence that research output of academic staff declined, staff productivity therefore gained at 2.5 per cent per annum measured by degrees and diplomas, and nearly 1 per cent per annum measured by students. Since staff earnings only just beat inflation (real growth rate around half a per cent per annum), the real cost of a student (to society) of a degree fell dramatically (see rows 8 and 9).

Table 2 shows that when output is measured by degrees and diplomas, the universities' performance in respect of output relative to input was much better than that of the British economy, public sector and private sector, as a whole. If the Government was to clamp down on a private sector industry with such a record, the whole nation would tell it was mad! Even when measured by students the performance, though not beating the economy, is not at all bad.

It is a general empirical law in economics that industries are most likely to experience above-average rising productivity when they are expanding. Surely the Robbins expansion was, in the main, because of its own economic effectiveness? In the future, if there is stagnation or contraction, for all the while and while that are



, he argues the economic return is so high and Robbins was so effective

going in, a repeat performance is most unlikely. In these conditions if the UGC's famous "unit of resource" (from resources available to universities from public funds, per student), is reduced, something, eg research, will have to give. In the context of a new expansion, however, the story could be very different. Sir Keith, Sir Peter, Margaret, Nigel, are you listening?

Table 3 gives the background to the circumstances which led to the cuts. Whether Mr Lawson is aware of its contents (which are taken of course from Government publications), one does not know, but they are unlikely to deter him from a target of freezing total real expenditure for some time to come, an ambition which, it must be admitted, does tend to command sympathy for most members of the population who are not also members of the Association of University Teachers, Nalga, the National Union of Teachers, the National Union of Public Employees, the Confederation of Health Service Employees, the British Medical Association, and so on. Nevertheless, the story told by Table 3 remains quite startling. The share of public expenditure on real things ("goods and services") in the national income has remained almost constant for a decade; probably for a decade and a half. It has increased slightly under the present Government, having previously been slightly declining.

Comparable data for higher education are not available, but would probably tell a similar story. Unfortunately, this story is only part of the whole problem. First, because, as well as on goods and services, the Government also spends on "transfers", ie transactions which economists regard as not involved in any real production, but

transferring between the population the fruits of already-created production. The most important items in assistance payments and interest on the national debt. Taken together, these two items increased from 12.8 per cent of Gross Domestic Product in 1972, to 15.4 per cent in 1979 (the last year of pre-Thatcher economics) to 19 per cent in 1982, probably slightly higher in 1983. The increase is almost entirely due to unemployment and high world interest rates. In it is the burden which as a society we impose on ourselves for being unable to find the political means to run a full employment economy without inflation. Being a fact of life, it is a fact of public expenditure, and affects all kinds of economic activities, including universities. So long as it is with us, we all suffer. If inflation, unemployment and interest rates come down permanently, a rational government could relax the constraint, but that does not mean, of course, that the constraint will in fact be relaxed.

The second extra part of the story, a vital part, is the problem of the so-called "relative price effect". By this is meant a tendency of public sector costs to rise faster than inflation, so that a constant share of the GDP in current prices means a falling share in constant prices. But the "prices" employed by the Government statisticians in the public sector, unlike the practice employed in the private sector, are not output prices but input prices. The "relative price effect", therefore means no more than that the quantity of labour employed by the public sector has fallen relative to the public expenditure share of the GDP. The "result" is shown in the third row of the table.

TABLE 1
Productivity trends in British universities
Average annual percentage growth rates 1972-82

	Crude	Weighted
Total input and output		
1. Academic staff	1.32	1.28
2. Academic staff real earnings	1.72	1.85
3. Students	2.23	2.16
4. Degrees and diplomas awarded	3.58	3.80

Input and Output Ratios		
5. Staff earnings per head	0.40	0.59
6. Students/staff	0.81	0.90
7. Degrees and diplomas/staff	2.26	2.54
8. Students/diploma-earnings	0.52	0.31
9. Degrees and diplomas/staff real earnings	1.88	1.95

Sources:
(a) National Income and Expenditure 1983
(b) University Statistics 1982-3, Vol. 1, Universities Statistical Record, Cheltenham.
(c) *ibid.*, Vol. 2.

Notes:
1. From (b), Table 21, full-time and part-time staff who are engaged on both teaching and research and wholly university trained. Weights in Col. 2: full-time = 2, part-time = 1.
2. Derived from (c) Table 5, cash figures adjusted by implicit deflator for consumer expenditure from (a) Table 2.6.
3. From (b) Table 2, Weighted, full-time = 2, part-time = 1.
4. From (b) Table 17, Weighted: Honours first degree = 3, pass or ordinary degree = 2, first diploma = 1, (earned) higher degree = 3, higher diploma = 2.
5. Growth rate of ratio of item 2 to item 1.

TABLE 2
Trends in cost-effectiveness of universities compared with whole economy
Average annual percentage growth rates 1972-82

	Universities	Whole economy
	Students	Diplomas
1. Output per employed or self-employed person	0.90	2.54
2. Real earnings per head	0.59	0.59
3. Difference	+0.31	+1.95

Sources and methods:
1. Col. 1 = item 6, Table 1 in this article (weighted); Col. 2, item 7 (weighted); Col. 3 derived from Tables 1.12 and 2.1 (GDP at 1980 factor cost), *Nat. Inc. and Exp.* 1983.
2. Col. 1 and 2 = item 5, Table 1 in this article (weighted); Col. 3 derived from Tables 1.2 and 2.5 *Nat. Inc. and Exp.*
3. *Ibid.* (income from employment and self-employment before tax adjusted by implicit deflator for consumer expenditure).
4. Let row 3 table minus row 2 row.

TABLE 3
Public expenditure and the national income 1972-82
Total expenditure of central and local government ("general government")
(Percentages of Gross Domestic Product at market prices)

	1972	1979	1982
Goods and services	22.0	21.6	22.7
of which			
Current	17.7	19.0	21.1
same adjusted for "relative price effect"	17.7	17.7	18.8
Domestic capital formation	4.3	2.6	1.8
Transfers	14.6	17.7	20.4
of which			
Subsidies	1.8	2.3	2.0
Current grants to personal sector	9.2	10.8	13.2
Debt interest	3.6	4.6	5.2
Other items	4.1	2.8	2.6
TOTAL	40.7	42.1	45.7

Sources:
(a) National Income and Expenditure 1983 Edition, HMSO, 1983; Tables 1.1 and 6.4.
(b) *ibid.* Table 1.1, *ibid.* Table 6.4.
(c) This row represents the preceding row adjusted by item 3 from Table 4 in this article.

It is a result which is no doubt of great interest to the public sector unions, but not to public sector consumers. We want to know whether the services we are receiving have been decreasing, increasing or staying constant relative to the growth of other goods and services, eg private goods and services, which make up both the GDP and our national living standards. For the reasons I have given, for the public sector as a whole, official statistics do not allow us to answer this question, but do allow it to be answered for universities.

Table 4 shows the answer is in fact spectacular. Row 4 gives a conventional measure (input prices in the public sector compared with output prices in the rest of the economy) of the relative price effect for general Government consumption: even this turns out to be less than most people imagine, ie no more than a 12 per cent rise over the whole decade. In the university sector, even on the conventional method of measurement our relative price effect is very small, because university teachers' real wages rose relatively slowly, it is significantly smaller than the public sector average. On an output measure, universities actually have a *negative* relative price effect—in other words, our real costs per unit of output fell relative to the economy as a whole; using students as the measure of output by 5 per cent over the decade, using degrees and diplomas by almost 20 per cent.

It is one of the most embedded doctrines of bureaucracy that in the public sector, unlike the private sector, efficiency, rather than being rewarded, tends to be punished. The UGC seems to believe this and the Government seems determined to prove them right. It would be funny if

it were not tragic.

The tragedy consists in the fact that on all the available evidence, those of us who work in the university sector, rather than having to defend our industry from cuts, should be participating with the Government and society, in planning a new expansion, irrespective of any other considerations, the benefit to the rest of the economy is extraordinarily high. If one simply evaluates benefits and costs in terms of enhanced earning power of the graduate, on the one hand, and teaching, administration and building costs, plus earnings foregone during study (a measure of the full national economic cost of the loss of labour time), on the other, the real return (meaning like an interest rate reduced for inflation, eg the present real return from a deposit account is about 5 per cent) to a university first degree is around 7% per cent (see Table 5; methods explained in footnotes). If account is also taken of the additional benefit of the spill-over effects for society as a whole, as a plus, and of a generous allowance for the special cost (or "shadow price") of public expenditure, as minus, it is slightly higher, ie 8 per cent.

These results are obtained by standard methods in a piece of research, commissioned by the DES, and subsequently widely circulated and to date not significantly questioned by the departmental or other economists. It is doubtful if there is any other sector of public activity, and probably not too many in the private sector, which can show a riskless real return of this magnitude. If universities were actually in business, and could recapture the full economic value of the benefits they create, investors would be flocking to buy their shares! Therefore, society

needs to decide how much of their output, in the light of costs and benefits, it needs. It is not "demand" that the UGC should be attempting to forecast, but supply. On the evidence, the answer could only be up.

Having established that our universities are highly efficient by comparative national standards, it is virtually inevitable that we should discover what David Ricardo called a "comparative advantage" in a particular sector (ie if one's productivity in a sector was lower, rather than higher, than other countries' one should still specialize in that sector if it happened that one was *less efficient* in it than in other sectors).

The necessary calculations, for all OECD countries (10) for which the required data are available, are shown in Table 6. Absolute advantage is measured by an international index of the productivity of university teachers—degrees and diplomas awarded per teacher per annum; and comparative advantage by dividing this index by an international index of average productivity—real national income per head of population measured in dollars of constant international purchasing power. There is no country in the table in respect of which, for universities, the UK does not have a comparative advantage.

Therefore everything should be done to maximize the nation's income from foreign students. Fees should be set at a long-term revenue-maximizing level: since the pound fell, they are probably on this criterion currently too low. In the UGC sector alone foreign students already bring in between £¼ billion and £½ billion of foreign exchange every year, a figure which surely doubles if all other foreign earnings from educational activities are included. In counterpart, foreign students of all kinds may create as many as 50,000 jobs. In encouraging more foreign students academic standards must be maintained, otherwise, in the long run, we will the product. Students from poor countries should be helped by constant pressure on the Government from the university establishment to divert foreign aid into scholarships.

So the general economic case for a new Robbins is undefeatable. But we still face the practical political reality of the public expenditure problem. We still suffer from the fact that every time an admissions tutor gives a candidate the nod, she or he is presenting the taxpayer with a large bill that she or he cannot refuse—to wit, £25,000. Every time an appointments committee gives tenure to a 25-year-old genius, there is another bill for £250,000 (discounted cash flow capitalization of salary and fringe costs over 40 years at 5 per cent).

For the sake of the nation, we must get the Treasury off the universities' backs. We must devise an administrative and financial system which would permit the freezing or partial freezing of total real public expenditure (including student maintenance) devoted to the UGC sector, while permitting individual institutions to find their own ways and means of increasing student numbers, without damaging research or placing excessive burdens on teachers. Much of this could be achieved by rationalization and flexibility, and we would gain enormously if we gave up the existing virtually unjustifiable tenure system and replaced it with a system of service contracts. Then, with a system of block grants to institutions, reviewed after periodic UGC visitations, each institution would have the flexibility, with fees set at full cost, to attract students or support research in its own way; full or partial fee remissions, subsidies or guarantees to student loans, etc. University teachers would continue to be judged on their performance both as teachers and researchers, with special emphasis on the latter. Never forget that in the United States, where the so-called "private" universities in practice live on a judicious mixture of public and truly private money, it is the institutions that do the best research who are the most successful in attracting students.

The author is professor of economics in London University and head of the department of economics at Birkbeck College. He is director of a course on the economics of higher education which is being offered at Birkbeck. It starts on April 30, lasts five weeks, and the fee is

PEER REVIEW

In December 1982 *The Times Higher Education Supplement* started a survey to discover how academics in various disciplines regarded the standing of their subjects. The results have now been reproduced in reprint form in two sections as follows:

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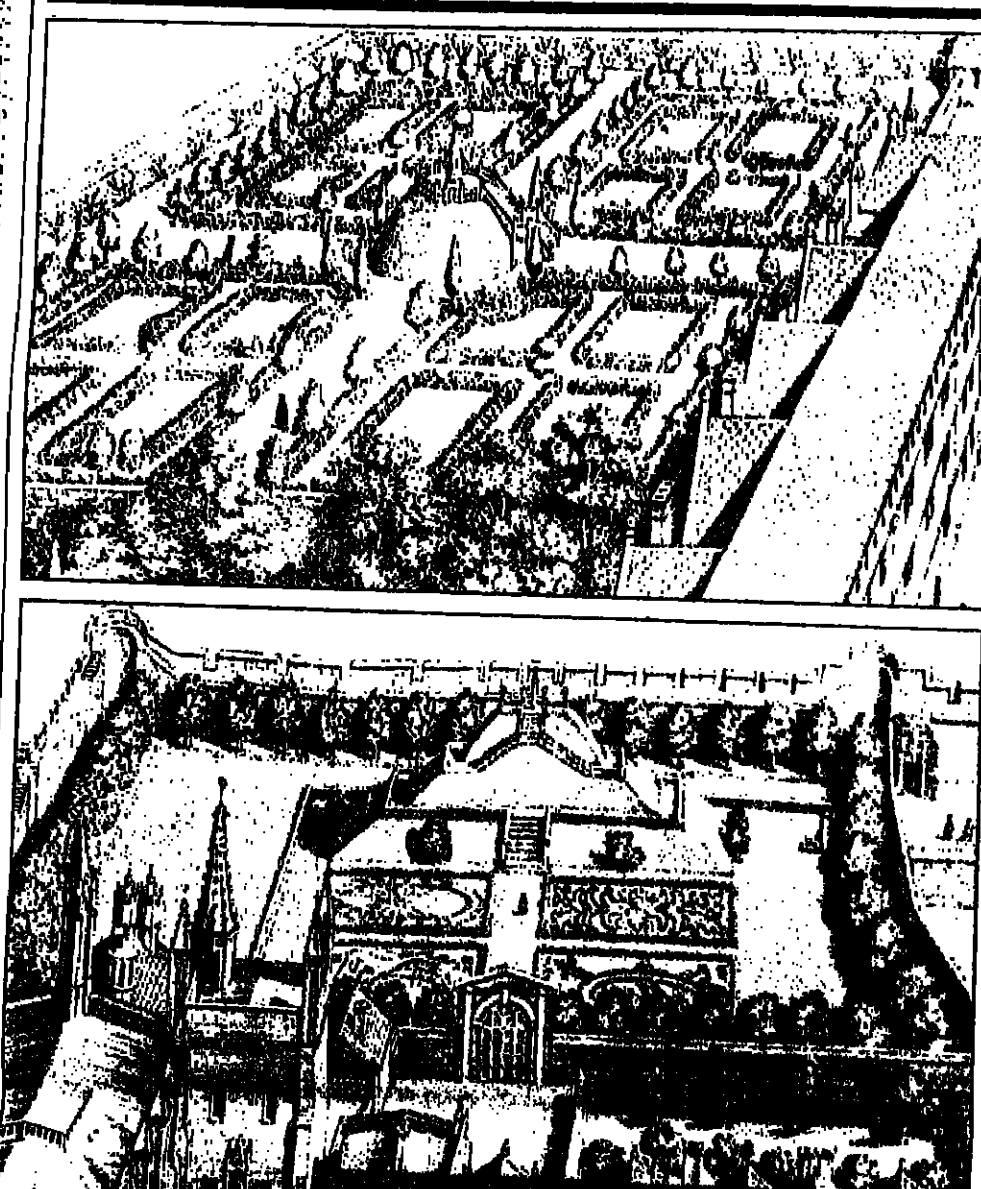
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Awards

At a meeting of the Royal Society on March 14, the following were elected as fellows:

Professor Edward R. Andrew, professor of physics, University of Florida, Gainesville; Dr Michael J. Iernig, AFRC Unit of Invertebrate Chemistry and Physiology, University of Cambridge; Professor Thomas L. Blundell, Professor of Crystallography, Birkbeck College; Dr Quentin Bone, Marine Biological Association, Plymouth; Dr Christopher R. Calladine, reader in structural mechanics, Cambridge; Dr David E. Cartwright, NERC Institute of Oceanographic Sciences, Birkbeck; Professor Philip Cohen, professor of biochemistry, Dundee; Professor G. A. M. Cross, Andrew and Bella Meyer Professor in Rockefeller University, New York; Professor David E. N. Davies, professor of electrical engineering, University of London; Mr Denis H. Derry, BP Research Centre, Sunbury-on-Thames; Dr Robert G. Edwards, reader in physiology, Cambridge; Dr Richard A. Flavell, MRC Institute for Medical Research, London; Professor Brian K. Foltz, professor of zoology, Bristol; Mr John A. Gulland, Marine Resources Service of FAO, Rome; Dr Ernest D. Hondius, various applications at National Physical Laboratory, Teddington; Dr James G. Howard, biomedical research division, Wellcome Research Laboratories, Beckenham; Professor John Henderson Knox, professor of chemistry, Edinburgh; Dr John R. Krebs, lecturer in zoology, Oxford; Professor Ronald A. Laskey, Charles Darwin Professor of Animal Embryology, Cambridge; Christopher H. Llewellyn-Smith, reader in theoretical physics, Oxford; Dr Gordon Lowe, lecturer in University of Oxford; Professor Alan G. J. MacFarlane, professor of engineering, Cambridge; Professor Peter M. Main, professor of chemistry, Sheffield; Dr Frank B. Mercer, OBE, president of Neilson Ltd, Blackburn; Professor Tetsuo Oki, professor of chemistry, Chicago; Professor Charles O. Otonari, professor of botany at Australian National University; Professor William Parry, professor of mathematics, Warwick; Professor John D. Pendry, professor of theoretical solid state physics, Imperial College, London; Dr Richard N. Perham, reader in biochemistry of macromolecular structures, Cambridge; Professor Frank H. Read, professor of physics, Manchester; Professor Gareth Owen Roberts, professor of applied physics and electronics, Durham; Dr Ian A. Shanks, Unilever Research Colworth Laboratory, Bedford; Professor Oswald Siddons, professor of molecular biology and head of the molecular biology unit, Tate Institute of Fundamental Research, IBM, Dr John J. Slachet, MRC National Institute for Medical Research, London; Professor Frank T. Smith, professor of applied mathematics, Imperial College; Dr Michael J. Steward, The Salford Research Laboratories; Professor Saffron Walden; Professor Keith Vickerman, professor of zoology, Glasgow; Professor David Williams, professor of pure mathematics, University College Swansea; Professor Michael M. Woolfson, professor of physics in University of York; Professor Peter J. Wyllie, professor of petrology and geochemistry, Chicago.

NOTICE BOARD



Garden history is a relatively new area of academic study. *The Renaissance Garden in England* by Roy Strong, £7.95, Thames and Hudson, looks at gardens of the palace and the great house from their inception in Henry VIII's reign until the outbreak of the Civil War.

Oxford colleges (above) favoured the Jacobean style, as demonstrated by David Loggan's 1670s drawing. Wadham College (top) had a garden east into quarters with a mount in the centre. New College garden (bottom) had knots laid out in the form of the royal and college arms and a sun-dial on a large mount at one end.

Honorary degrees

BRISTOL
MAI Mr Douglas Morris (general manager, Bristol Old Vic); Mr Evan Wright

Open University viewing

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BOOKS

Italian ideal

D.H. Lawrence in His Time: 1908-1915
by Kim A. Hovzinger
Associated University Presses, £18.50
ISBN 0 8387 5028 1
D.H. Lawrence and the Experience of Italy
by Jeffrey Meyers
University of Pennsylvania Press,
£19.00
ISBN 0 8122 7861 5

Two major periods of Lawrence's life and writing career are covered in these books - the early phase as a school-teacher in Croydon and then burgeoning professional writer in London and on the continent, in the period 1908-1915, and the mainly postwar Lawrence of the 1920s who led a nomadic existence in Europe, Australia and America, but in so far as he had roots and a home base found these in Italy. They might roughly be equated with the English and the expatriate Lawrence, were it not that the most vital element in the English Lawrence, the Lawrence of his native Nottinghamshire and Derbyshire, is virtually excluded.

D.H. Lawrence in His Time becomes a study of Lawrence's connections, often tenuous enough, with the ephemeral literary movements of the early twentieth century (Georgianism, Imagism, Vorticism and the like); and *D.H. Lawrence and the Experience of Italy* provides an opportunity for essays on such subjects as Lawrence's travel books, the brilliant, though still neglected, *Magnus Introduction*, the poems of *Look! We Have Come Through!* and *Birds, Beasts and Flowers*, and the leadership novels which, despite the fact that only one of them, *Aaron's Rod*, is actually set in Italy, derive their political themes from the turbulent Italy that Lawrence saw at first hand in 1920-22.

In both of these phases, however, Lawrence was an outsider, excited for a while to be taken up by literary London in the prewar years, and subsequently an admirer of the war-blooded Italian peasantry with whom he felt himself in some kind of mystical harmony, but never deeply intimate or inward with the cultural aspirations of the first, or the essentially alien way of life of the second.

Of the literary movements discussed by Kim Hovzinger, Georgianism receives the most attention and is probably the most important. He takes the disparaged Georgianism seriously and finds that they and Lawrence have "significant points of contact" - a pastoral emphasis, a Wordsworthian feeling for the relationship between nature and the self, and anxiety about the destructive encroachment of industrialism.

Herzinger quite rightly sees these themes as having a bearing on both *The White Peacock* and *The Rainbow*; but he also sees the inevitability of Lawrence's reaction against the dilettante weakness of Georgianism, implicit in the anti-pastoral counterpoint to the self-consciously fine writing of *The White Peacock* and made decidedly explicit in *The Rainbow* through the savage energies which demand acknowledgement and incorporation within a quite un-Georgian sense of the interaction between man and nature.

The most interesting chapter, however, is the one devoted to "The Georgians, the War, and (England) My England". Egbert's attempt to fill the "savage England" of Crockham with the "living romance" of colourful flowers is a symbol of inadequacy: "Lawrence clearly wants us to understand that to attempt to sweeten the truth is tantamount to a failure to recognize it. And such a failure is dangerous." In typically Lawrencean fashion, the hero's death in the trenches follows from this. Herzinger seems not to question whether that death is a satisfactorily imagined consequence, but his sense of the satirical animus that directs the story to its conclusion puts "England, My England" in a true perspective. It is, as he says, "one of Lawrence's more pointed attempts to 'wing' a functioning centre of the British cultural milieu - the Georgians - and it stands as one of his

most powerful explosives for satisfying his intention to "lay a mine under their foundations".

Rather unexpectedly, the core of Jeffrey Meyers' book proves to be the chapter on "Fascism and the Novels of Power". It is in *Aaron's Rod*, *Kangaroo* and *The Plumed Serpent* that Lawrence seems to carry on from where "England, My England" leaves off. The aberrations of these novels, and in particular their preoccupation with the idea that the collapse of social and individual order can only be overcome by submission to a leader, are a direct result of Lawrence's disgust with the inadequacy of what in the widest sense might be regarded as Georgian liberalism.

The confusion that runs through each of them, and reaches its culmination in the simultaneously preposterous and appalling religious politics of *The Plumed Serpent*, expresses the frustration of what Lawrence calls his "societal instinct". They do not, of course, advance serious propositions, and, as Meyers shows, they are not

proto-fascist; instead, they explore possible images of power and authority, invariably finding in the process of exploration that the absurdity or masochistic horror of the images comes to the surface, and ends inconclusively with rejection, or at least the implicit recognition of the impossibility of acceptance.

The underlying relevance of Italy lies in the political conditions that preceded the rise of Mussolini, and even more profoundly in the emotional appeal that Italy has always made to expatriate English artists, precipitating the ideal of a levellers' paradise in sharp contrast to the disintegrative, bomb-throwing mess of the contemporary reality. It is this which Lawrence projected on to Australia in *Kangaroo*, without, in this case, support from the current Australian situation, and was brought still more forcibly to mind by the murderous state of revolutionary Mexico.

Love of a militaristic aristocracy was certainly not the lasting truth behind it all. As Lawrence's letter to Witter

Bymer (March 13, 1928) shows, he finally disabused himself of "the leader-cum-follower relationship" and turned to the new (which was also for him the old) relationship of "some sort of tenderness, sensitive, between men and men and women".

For Meyers this, too, is essentially part of "the experience of Italy". In *Lady Chatterley's Lover*, he suggests, "Mellors is the essence of the Italian spirit, transposed to and expressed in English". But more obviously, the Nottinghamshire setting indicates an imaginative return to the region where Lawrence had known at least some satisfaction for his "societal instinct": "the country of my heart", as he called it in a letter written from Italy in 1926. Meyers touches on this connection when he quotes from "Nottingham and the Mining Community" to associate the Nottinghamshire miners with the Italian peasants as people who "lived almost entirely by instinct", but there is also an interesting contrast between Siena, representative of the city which satisfies "the real urban side of a man,

the civic side", and the "agglomeration" of Nottingham. The "Autobiography" of Lawrence, published in *Phaedra* and recently transformed into an Italian edition, longingly refers to the "Mining Community", but is critical of the failure of the Nottinghamshire and the Italian miners; but what is significant is that to create the idealized text for full, social living in the environment. It is there, it is said, that the outsider once had some sense of being an insider, an "Italian experience", along with intellectual experiences and their full meaning only

Ronald Draper

Ronald Draper is professor at the University of Aberdeen.

Familiar topics

The Literature of the United States of America
by Marshall Walker
Macmillan, £14.00 and £3.95
ISBN 0 333 32298 3 and 32299 1

Professors of American literature should probably not review histories of that subject. After all, such books are not written for them. Since Moses Coit Tyler at Michigan in 1878 and John Nichol at Edinburgh in 1882 the scene for great originality in histories of American literature has not been intimate and the shock of recognition is unlikely to be sufficient to sustain professional enthusiasm for long. The ground that must necessarily be covered is neither boundless nor uncharted and to try to avoid such familiar topics as spatial vastness, the frontier, the American dream, individualism, non-conformity, and so on, is, if we are to be honest, no more desirable than it is possible. Deviations from the broadly chronological framework are not easily accomplished with success either.

The general editor's preface to the Macmillan History of Literature describes the relating of literature to its social and historical context, and Marshall Walker tries conscientiously to achieve that. Inevitably his problem is the predetermined length of the volume. To suggest a sense of continuity and to help the newcomer orient himself his brisk opening chapters draw parallels with the modern world and its culture, including film and current affairs. To emphasize the relevance of earlier periods he strives to keep the intermediate future in view, yet it may be questioned whether the newcomer is much helped by such breathless compressions as this:

Roger Williams's community of religious toleration anticipates more secular Utopian experiments such as George Ripley's Brook Farm Institute (1841-6) at West Roxbury - the basis of Hawthorne's novel *The Blithedale Romance* (1852) - and the Helicon Home Hall colony (1906-7) which Upton Sinclair (1878-1968) founded in New Jersey on the proceeds of *The Jungle* (1906), his influential novel of protest about the Chicago stockyards.

Similarly the information that "John Pendleton Kennedy's (1795-1870) light-weight *Swallow Barn* (1832) (1871-1929) for its portrayal of plantation life" requires, to have any value, knowledge of Parrington's status and ideas beyond the uninitiated reader. However, if such brevity can be the whole of mental indigestion, it is the wholly absent "Longfellow is fluent and forgettable" or "St. Cooper's Leatherstocking series" "The whole is larger than the sum of its ineptitudes".

I do not wish to be captious. If the economical system of parenthetical dating does not jar too much, this is a very readable and informative guide. The inclusion of a map of the US meets a beginner's need too often overlooked, the appended chronological table tightens the loose links between literature and history which in the text become somewhat intermittent, and the necessarily selective further reading list is judiciously predictable. In

general, Walker has a good eye for the essentials and the telling quotation.

His emphases, of course, can be disputed: rather too much (proportionally) on Henry James, too little on John Dos Passos and realism in the 1930s, and Upton Sinclair merits rather more notice than merely the few words quoted above. On the other hand, Sinclair Lewis gets a fairer deal than usual and the juxtapositioning of him with Scott Fitzgerald is interesting. The First World War had an impact on American literature greater than is here suggested, though. The discussion of southern literature since the 1920s is perceptive, though over-generous to Robert Penn Warren at the expense of Allen Tate.

All these are matters of opinion. The crucial question - how stimulating will it be for our newcomer? - is best answered by that newcomer. It is direct and uncluttered by jargon or trendiness. It is reliable enough in its compactness, though better on individual authors than on movements. The chapter on "Modernisms", for example, embraces so much in its plurality that the identity of modernism is less clearly established than one would wish. The 18 plates are mostly chosen with imaginative originality (including some effective ones by Walker himself) - though the substitution of a Currier and Ives print for one of the two Norman Rockwells would have widened the view of popular art. Indeed, more could have been made in the text too of parallels between literature and the other arts, but there is never room for everything.

Dennis Welland

Dennis Welland was until recently professor of American literature at the University of Manchester.

Exemplary realist

La Regenta
by Leopoldo Alas, translated by John Rutherford
Allen Lane, £14.95 and
Penguin, £8.95
ISBN 0 7139 1637 0 and 14 044346 0

It is a curious fact that in Spain, whose greatest writer, Cervantes, arguably initiated the novel form in Europe, the modern novel did not emerge until the 1860s, following the revolution of 1808. Even then it was only in the 1880s, when, on the one hand, the political consensus enshrined in the constitution of 1876 was well established and, on the other, the works of known Spanish novelists became novels focusing on more than narrowly Spanish issues were published.

Leopoldo Alas's role in fostering the literary critic and political progressive, he strongly defended Zola's Naturalism, notably that towering genius, Benito Pérez Galdós. His thoroughness partly explains why his first novel, *La Regenta* (1884/85), was so extraordinarily accomplished. Set in the stagnant provincial town of Vetulonia (a fictional town of Vetulonia), it is a masterpiece of the novel form, with its look and feel of a

this novel deals with Ana de Goyeneche, the young wife of a retired judge. The husband is something of an old fool, impotent and obsessed with the drama and humour of the seventeenth-century Spain. Eager to satisfy her strong emotional urges, Ana is torn between divine love, represented by an ambitious priest, Fermín de Pas, and carnal love, represented by a cynical philanderer, Alvaro Mesía. In her self-indulgent way, she attempts to maintain the spiritual friendship with her "soul-mate", de Pas, while backing from afar in the adoration of Mesía. But both men are flesh and blood and both are determined to gain total power over her. This duel, with its teasing changes of fortune and pseudo-triumphs, lasts for most of the novel, the culmination of which is seduction, death and humiliation.

Alas's deft irony, revealing a taste for the grotesque (if not for the aspect of Vetulonia life. The novel's main character has the "look of an old Guinevere", the local atheist, is a self-declared atheist, and indeed, he is declared "business" in an aristocratic luncheon the marquis begins an usual by devouring a huge plate of palehards and then withdrawing.

When the master of the house, referred to his place he was a little pale, and perspiring.

"All right," muttered the marquis, "I will look at you with my

Her husband replied with a look which meant, "Perfectly." He helped himself to a generous portion of turtle soup. The plate was no longer inside his hands. Another mystery.

Alas is also excellent at conveying atmosphere and sexual undertone. For example, a ball in the past man's club or midnight mass at the cathedral.

But his greatest achievement is his mastery of the exploration of the atmosphere and the sexual undertone. For example, a ball in the past man's club or midnight mass at the cathedral.

Maurice Hemingway

Maurice Hemingway is professor of Spanish at the University of



Detail from *Raftsmen Playing Cards* by George Caleb Bingham. It is taken from *Art of the Nineteenth Century*, painting and print (Thames and Hudson, £25.00).

BOOKS

Evolving economy

Russian National Income, 1885-1913
by Paul R. Gregory
Cambridge University Press, £22.50
ISBN 0 521 24382 3

Paul Gregory has made the first thorough quantitative examination of the evolution of the Russian economy as a whole before the First World War. His results provide an instructive example of the usefulness of such painstaking exercises for our understanding of major problems of historical development.

The Russian pre-revolutionary experience has proved a contentious episode in the history of the industrialization of the world. The heroic attempt of Finance Minister Witte in the 1890s to use the power and influence of the autocratic tsarist state to force the development of heavy industry was seen by some of his contemporaries as a disastrous artificial break with tradition which shattered the fabric of society, by others as a laudable stride towards modernization, and by revolutionaries and dissidents as a vain effort to prop up a crumbling regime. The arguments have continued for almost a century.

Professor Gregory's tables do not of course offer any unambiguous resolution of these rival interpretations. But they provide the historian with certain quantitative limits within which the debate henceforth needs to be conducted. His estimates confirm that both capital investment and state expenditure were an unusually high proportion of Russian national income in comparison with other countries at comparable stages of development. But this was not an entirely new development solely associated with the industrial boom of the 1890s; Witte's industrialization drive merely strengthened a pronounced existing trend. Moreover, state expenditure was not directed primarily towards economic development: tsarist government expenditures "reflected the heavy burden of entering in military competition with the more advanced European countries [Soviets please note] and the relative size of the Russian bureaucracy". The state encouraged industrialization, but on the whole it did not provide finance for it. The high level of investment in pre-revolutionary Russia remains a major unexplained item on the agenda for future research.

Professor Gregory's estimates also illuminate another important debate. Until fairly recently almost everyone agreed that Russian industrialization, in the 1890s as under Stalin, was carried out at the expense of agriculture and the peasantry. This view found classic expression in Alexander Gerschenkron's famous article in volume VI of the *Cambridge Economic History of Europe*. But latterly several serious historians have expressed strong doubts about this proposition; and Professor Gregory undermines it still further.

He finds that agricultural performance was significantly better than Gerschenkron, Goldsmith and others had claimed. Largely in consequence of this revision, he obtains an average annual growth of national income, over the whole period 1885-1913, of 3.2 per cent against Goldsmith's 2.75 per cent. The difference may seem slight. But during this period the population increased by over 1.5 per cent a year, so that Gregory's revision provides for a substantially more rapid growth in income per capita than the previous estimates. In the Russian Empire as a whole, a slow and irregular but nevertheless substantial increase in consumption per head accompanied the increase in investment and the growth in agricultural production was sufficient to sustain a steady increase in the amount of grain and other foods retained by peasants for their own consumption.

Gregory's estimates need further refinement. The retail trade data which provide an important component of his consumption figures are rather crude. The sudden jump in his livestock figures in 1909 seems to be due not to improved agricultural performance but to the inclusion of Central Asia and the Transcaucasus in the

Only one real class

The World We Have Lost, further explored
by Peter Laslett
Methuen, £12.95 and £5.95
ISBN 0 416 35350 1 and 0 416 35350 9

When it was first published in 1965 Peter Laslett's *The World We Have Lost* was recognized as a very original and important book. A second edition was published in 1971; and since then it has been reprinted five times. It has that rare quality of being a book that can both challenge scholars and at the same time appeal to the general reader. Now it appears in a third edition with an intriguingly amended title. It is basically the same book, but with an additional 15,000 words in-

underlying series. His estimates of peasant consumption provide only an Empire-wide average, and it is certain that the rising average level of consumption of the Russian peasantry as a whole was accompanied by impoverishment in important regions and among certain social groups. But he persuasively demonstrates that in the Russian Empire as a whole agriculture by no means stagnated as a result of industrialization, a result which is confirmed by the independent estimates of Stepanov and others.

He is less successful in hazarding some preliminary comparisons of Russian national income in 1913, the last pre-war year, with Soviet national income in 1928, the jumping-off year for Stalinist industrialization. Soviet data, compiled by highly-respected economists in the State Planning Commission at the time, and still accepted by the Soviet official statistical agency, purport to show that by 1928 the national income was probably some 18 per cent above the 1913 level (an increase of at least 7 per cent per capita). According to Gregory's estimates, these figures must be revised sharply downwards: in 1928 national income was probably some 5-10 per cent lower than in 1913, a decline of 15-20 per cent in per capita terms. According to Gregory, the first years of Stalinist industrialization after 1928 was concerned with recovery to the pre-war level rather than with further expansion.

The Soviet figures undoubtedly somewhat exaggerate the extent of recovery by 1928. But Professor Gregory's estimates go too far in the opposite direction. His figures incorporate a decline between 1913 and 1928 of more than 40 per cent in grain and other food products retained by peasants for their own consumption. Peasant incomes in kind are notoriously difficult to measure. But such a drastic decline seems to be more unlikely, and to be a result of the different methods of measurement in Gregory's 1913 estimates and in the Bergson-Hoeffding estimates used by Gregory in 1928. Thus the 1913 figure includes grain transported by cart, while the 1928 figure excludes it. On the other hand, Professor Gregory greatly overestimates the relative level of capital investment achieved by 1928. Much still remains obscure in these years.

Professor Gregory concludes his study with some useful comparisons between Soviet and tsarist economic performance. The average rate of growth of Soviet national income, as measured by American economists, was between 5 and 7 per cent per annum over the period 1928 to 1975 (omitting the decade of the Second World War and its aftermath). In per capita terms this was more than double the rate of growth of Russian national income estimated by Professor Gregory for 1885-1913. This was in turn the result of an extremely rapid increase of the share of investment in national income, and a slower but substantial increase in employment. Although the tsarist national income was distinguished by relatively high investment and state expenditure, it was dwarfed in both these respects by the dramatic changes in the Soviet period, which established the Soviet experience as "a unique and distinct development model".

R. W. Davies

R. W. Davies, professor of Soviet economics at the University of Birmingham, is the author of a multi-volume history of Soviet industrializa-

tion. He has also written a book on the history of the Russian Revolution, and a book on the history of the Russian peasantry.

corporate throughout the text to take account of research published since 1965. Laslett's comprehensive list of additions has given the book a more academic cast than it originally had. But he need not worry. It is still a book of interpretation for both the specialist and non-specialist alike.

The wide appeal of the book stems from Laslett's conviction that in the last resort the importance of history for most of us is that it is knowledge about ourselves and the world in which we live. He recognizes only too well the scholarly dangers of present-mindedness, and indeed castigates historians who do not make sufficient effort to free themselves from the political beliefs and social controversies of their own day. But his own sympathy and insights into the everyday lives of people in the past shine out clearly from his pages, and enable him to make fascinating history from the apparently unpromising records of birth, marriage, death and social structure.

Urban Workers in the Early Industrial Revolution
by Robert Glen
Croom Helm, £19.95
ISBN 0 7099 1103 3

Though essentially a local study (its proper title should be "Urban Workers in Stockport and its immediate district in the early Industrial Revolution"), Professor Glen's book contains a unifying theme of great general significance. He drives a further nail into the well-hammered coffin of the thesis that an English working class had been created by 1832. He surveys the secondary literature on class in a short first chapter which students could profitably read alongside K. J. Morris's more ambitious and extensive, but not always so clear, pamphlet. Thereafter he launches himself into a detailed account of the development of Stockport between the 1770s and the 1820s.

It is not primarily an economic study, but the account of the activities of working men benefits substantially from a deep knowledge of the structure of the cotton trade. Glen has culled away not only the history of Manchester and Stockport press but also at quarter sessions records, miscellaneous local materials on public order and the Home Office, War Office and Treasury Solicitor's papers in the Public Record Office.

Stockport, of course, was no arbitrarily-selected northern industrial town. It was in the van of late eighteenth and early nineteenth-century industrial development, its rate of growth exceeded that of surrounding towns. Its population, already 5,500 in 1779 almost trebled in the next twenty years and then almost doubled again in the next thirty. Its handloom weavers were exposed earlier to the devastating twin effects of over-stocking and competition from the power loom. If anywhere, Stockport should provide every evidence of class formation.

But it did not happen. Glen sheds considerable light on the previously opaque subject of Lancashire and Cheshire Luddism and concludes that its leaders were not the more established weavers but "marginal men... weaving the cheapest types of cotton cloth", men more vulnerable to trade depression and least likely, since they were recent immigrants, to qualify for poor relief. Glen is persuasive also on the industrial movements of 1815 to 1819 which culminated in Peterloo. There was much "internal diversity and lack of cohesion". Those skilled adult male weavers still able to exploit labour scarcity preferred sectional trade organizations and combinations. Mass support for radical political movements was ephemeral and directly related to economic distress. The minority of zealous political radicals, whether Huntite "Christians" or Carlilite "republicans and atheists" were almost as likely to be minor professional men as skilled, literate artisans and were prone to internal dissension anyway.

I have only one major reservation. While Glen's decision not to go beyond the early 1830s is justifiable in view of the dramatic change in Stockport's social structure resulting from termination in 1827 of less so. One needs to know how Stockport reacted to the Reform Act crisis and to the political unions of the early 1830s. This

is the more important since one of Glen's three main conclusions (to be set alongside a lack of "worker solidarity") and the limited nature of political objectives is that "the solidarity of the middle and upper classes and their hostility towards workers has been vastly over-rated".

Nevertheless, books such as Glen's surely indicate that romantic notions of class solidarity born of shared economic and cultural experiences of deprivation and discrimination collapse before the steady accumulation of irrefragable evidence to the contrary. The intoxicating convictions of twenty years ago have been first qualified, then confounded, by the facts. Historiographically, at least, the working class has been well and truly un-made.

Eric J. Evans

Dr Evans is senior lecturer in history at the University of Lancaster.

class, but that in pre-industrial society there was only one small group of people exercising effective collective power, political and economic. There were many gradations of social status, and conflict between groups; but only one real class which was nationwide, the Gentlemen.

The second controversy - over the concept of the English Revolution in the seventeenth century - is dealt with at some length, and Laslett confronts his critics squarely. In particular he challenges Christopher Hill's class interpretation of the seventeenth-century struggle; and in the chapter on social change and revolution in the traditional world argues that the English Revolution is misleading and should be dropped. In fact, there never was such a set of events as the English Revolution. Not all readers may be able to accept quite such finality; but Laslett's warnings about the dangers of using words like "underlying", "reflecting", or "expressing" when dealing with social change, or exaggerating the significance of contradictions and conflict, are well taken.

In its general proportions *The World We Have Lost*, further explored is as before: that is, it is mainly about the seventeenth century, with a few backward glances to the Middle Ages, and a chapter on the early twentieth century for comparison. But there is nothing on the eighteenth and nineteenth centuries and the process of industrialization. Laslett justifies this on the grounds that he is writing comparative, not narrative history; and he admits that to abandon the traditional history's method of writing history as a story, with its emphasis on development, process and evolution, may seem wrong-headed. His plea is for a new type of history, not so much sociological history as social structural history.

J. F. C. Harrison

J. F. C. Harrison is honorary professor of history at the University of Sussex.

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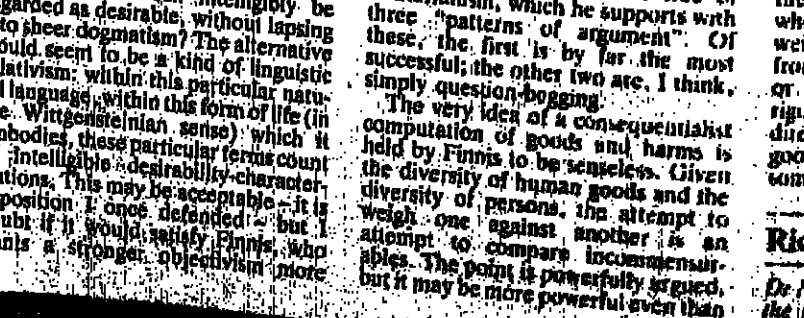
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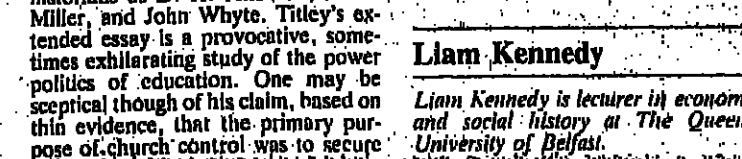
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His discussions are laced with many memorable illustrations, such as that of Hilbert's hotel, which reveals a possibly surprising feature of infinity. (The hotel contains infinitely many rooms, every one of which is full. When the belated traveller arrives, however, he can easily be accommodated; for each occupant simply moves along one room, leaving Room 1 vacant. "There is a temptation to think that some unfortunate resident at the

...innis's book we find altogether more elevated moral tone, dominating in some stern remarks about the prospect of hell. Drawing on the tradition of Aristotle and Aquinas, he belabours the twin evils of moral relativism and consequentialism. In the first struggle Kupperman would be ally, in the second he would be found in the front ranks of the enemy. Innis's most powerful argument



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Liam Kennedy is lecturer in economic and social history at The Queen's University of Belfast.

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...war, Finnish aspi-
...ism which can say "Never
...ectly against any bank
...ood." This must, I think, be
...ometimes be an evasion.

Norman is lecturer in physics
at University of Kent.

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BOOKS

BIOLOGICAL SCIENCES

Ominous cloud of suspicion

Scientists Confront Creationism
edited by Laurie R. Godfrey
Norton, £15.25
ISBN 0 393 01629 3
Science and Creationism
edited by Ashley Montagu
Oxford University Press, £22.00
ISBN 0 19 503252 7

At Little Rock, Arkansas in December 1981, the State of Arkansas defended its Act for the "balanced treatment" of creation science and evolution science in the school curriculum (Act 590) against a large number of plaintiffs. As the prosecution wheeled on first one and then another eminent scientist, philosopher, theologian or historian, it became increasingly clear that the state had taken on far more than it could handle. For this was to be no clash of well-matched giants, along the lines of the famous Scopes Trial of 1925, but rather a systematic destruction of the intellectual pretensions of a motley collection of cranks and fanatics by the might of the American academic establishment. The result was a clear decision: "creation science" had no place in science, and therefore no place in the science curriculum of American public schools.

However, despite the striking down of Act 590 and the subsequent barrage of anti-creationist literature, the threat of scientific creationism is not receding. Louisiana has creationist legislation of its own which is currently the object of litigation; and if it comes to court, it is far from clear that the ruling will once again be on science's side. Moreover, although the legal battle has been going in evolution's favour, the same is not true of the battle in the classroom. Those who are impressed by the elegance and the eloquence of the anti-creationist literature would do well to ponder the fact that, as local communities lobby their school boards up and down the United States, evolution is rapidly disappearing from textbooks and public school curricula. There is thus a very real possibility that evolution will win in legislative theory but lose in educational practice. This makes the steady stream of written counterattacks to creationism which have flowed from the Arkansas case all the more important; and these two collections of essays are good examples of the genre.

As its title suggests, Laurie Godfrey's *Scientists Confront Creationism* refutes anti-evolutionary arguments on chiefly technical grounds. In a

series of short and incisive chapters it deals with such issues as the age of the Earth, the origin of life and the molecular, systematic and geological evidence for evolution. Although the geological evidence looms rather large in comparison with its importance in evolutionary theory, this may perhaps be forgiven in view of the creationists' obsession with fossils; but it is a shame that other relevant topics (such as artificial selection, ecological genetics, and biogeography) find no place at all. This apart, however, the book is well-written and sets out its strong case rather well.

Ashley Montagu's *Science and Creationism* attacks its enemy on an altogether broader front. Starting and finishing with the Arkansas trial (the judge's impressive decision is reprinted in full), it covers not only the scientific issues (again concentrating overwhelmingly on the fossil record) but also some of the historical, philosophical, social and legal questions with which they are intertwined. Montagu has a great deal of experience in the editing of collections of critical essays. Interestingly, most of his previous efforts have been directed against the incautious adventures of biologists into the human sciences, and this is the first time that he has taken their part in a major dispute. But Montagu is at heart an evolutionist of large and liberal vision; and he recognizes all too clearly the threat that creationism represents to the free spirit of scientific inquiry. Having failed, as he tells us, to "respond adequately" to the creationists "within the brief compass of a verbal debate," he has seen fit to spell out the scientific and philosophical case for evolution for the benefit of "all who seek a clarification of the issues involved".

This quotation raises what I take to be the crucial question that needs to be asked about these books and others like them: what exactly are they likely to achieve? Obviously, their broad aim is to present the scientific case for evolution to anyone who is prepared to listen. As a matter of fact, I suspect that the main readership for these works is among students, teachers and researchers who are already scientifically literate, enough to accept evolution. For this audience, presumably, the benefits obtained are greater: understanding of the evidence, greater skill in verbal fencing with creationists, and the warm glow that comes from knowing that one is fighting on the side of the angels. Although these are real benefits, it is hard to believe they are the only objectives of authors and publishers in this field. Rather, one gets the impression that they are aiming their work at those floundering voters who remain to be convinced, and who are the other about evolution; and it is here that their most obvious weaknesses are revealed.

To try to persuade a sceptic of the truth of evolution by piling evidence upon evidence is an understandable but misguided approach, since it overlooks the obvious fact that in general it is not evidence (or the lack of it) that caused the scepticism in the first place. The trouble with evolution is that, unlike most other biological theories, it is widely believed to carry with it all kinds of unacceptable moral, political and religious consequences. It follows that doubts about evolution are best



Raccoon searching for food on the shore of a pond. From *The Pond* by Gerald Thompson and Jan Coldrey, published by Oxford Scientific Films and Collins at £12.95.

laid to rest not by rehearsing elementary matters of fact that may be found in any decent biology textbook, but rather by directly confronting these wider issues. What troubled lay-people really need is not more facts, then, but a better understanding of why evolution either does carry unacceptable ideological consequences (in which case they had better re-examine either the science or their ideology) or else does not (in which case they had better find something else to worry about); and this is an area that neither of these volumes properly explores.

Of course, the issue is complicated by the fact that, largely for tactical reasons, the leaders of creationism have taken in recent years to cloaking their ideological concerns in scientific garb. But simply to accept this move at face value, as most anti-creationist works are now doing, is to enter a futile debate which has all the appearances of being scientific but none of the substance that makes genuine science-

tific disputes ultimately resolvable.

A comment made by the anthropologist Alice Kehoe in Godfrey's "The United States of America" problem; asserts, "is not a Christian nation but a secular nation that offers each of us the freedom to live according to his or her own spiritual beliefs, as long as they do not involve harm to others". This, as any Reaganite will tell you, is the most utter nonsense. American as a Christian, and more particularly a militant evangelical Protestant nation that tolerates the wide variety of alternate creeds that are housed under its roof. Unless and until it finds a way of squaring its fundamental beliefs with the findings of modern science, evolutionary theory will remain under an ominous cloud of suspicion.

John Durant

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Sound detection

The Acoustic Sense of Animals
by William C. Stebbins
Harvard University Press, £14.05
ISBN 0 674 00326 8

Although it is difficult to imagine what any animal actually experiences of the world about it, careful research has elucidated the ways in which their sense organs work and the impressions they provide of the environment. Hearing holds perhaps the biggest surprises: fishes and birds detect infra-sounds far below our pitch range, whereas most other mammals and

many insects respond to ultrasound several octaves above it. Pitch discrimination, directional localization and intensity all vary widely in the animal kingdom, leading to radically different ways of coding the messages that are transmitted. Some animals even use sound echoes to locate surrounding objects.

The evolution of hearing is a fascinating subject. On the one hand, we have the vertebrates: fishes developing through amphibians to face the tenuous medium of air, culminating in the highly sophisticated systems of sound analysis in birds and mammals. On the other, true hearing in invertebrates is restricted to certain groups of insects - here, there is no common plan, a variety of "ears" having developed independently, apparently in

response to individual needs in form and function of all these systems naturally involve a wide range of principles, the comparative work hearing not only offers much of interest but also challenges problems for scientific research. Stebbins makes the incoherence that his book is the first to restore entire range of sound-detecting systems. But the inclusion of insects does nothing to improve on the patchy and generally disappointing. Indeed, it is not at all clear for the book has been written, after the epilogue does suggest a post level up to "specialists in other fields acoustics". Such readers, however, likely to find it unsatisfying, and layman is more likely to be cold than enlightened.

The book is careless, contrived and often quite misleading. The language is well-consciously simple but extent of explaining terms such as "ultrasound" (human hearing limit) and "acoustic" (setting), which are very helpful. The third style table "primarily struggling to speak in a less modern" ("the book is unquestionably mammalian" (sic) seems self-evident). It is hilarious to learn that Weber dissected the ear, fish "with... the eyes of an eagle" (sic) errors include turbulence for turbulence (singular sensillum), resolve for resolve (singular sensillum), resolve for resolve (singular sensillum), resolve for resolve (singular sensillum). One full page figure is used too which seems wasteful.

More seriously there are gaps of fact and representation. The statement that the "evolution of the vertebrate ear from the invertebrate ear is shrouded in mystery" is nonsense, as they are quite unrelated; and a few earlier we are told as much. As for echolocation operating "in a manner analogous to that of the human eye" with a degree of resolution approaching that of the vertebrate eye... what degree of resolution approaching that of the vertebrate eye? The angular resolution at best is more than two orders of magnitude worse and they work in different coordinates. Of two echolocation "species", the bats and cetaceans, the former are apparently restricted to the northern hemisphere. And although drawings of two bat faces are complete attributed to me, one is transposed from Europe to the New World and the other has been embarrassingly embellished with fantastic adornments.

As a psychologist, the author describes techniques of instrumentation in a clear and at length, but physiology is apparently completely too difficult. Some physics is attempted but this is confusing and there is no account of near-field/field propagation or the differential pressure principle, which have together contributed so much to clarifying "echolocation" in recent years. Man is discussed as the peak of finess in sound analysis, yet every aspect can be bettered by examples given earlier in the book, usually without comparable data. This gee-whiz account of unexplained mysteries of science cannot be recommended at any level.

J. D. Pyle

J. D. Pyle is professor of zoology at Queen Mary College, London.

THE TIMES HIGHER EDUCATION SUPPLEMENT 6.4.84

BOOKS

BIOLOGICAL SCIENCES

Life size

On Size and Life
by Thomas A. McMahon
and John Tyler Bonner
Scientific American Library
Freeman, £14.50
ISBN 0 7167 5000 7

The largest living things are colossal: hundred-ton whales and hundred-metre redwoods. The smallest mycoplasmas are almost unimaginably small, able to contain only a thousand or so protein molecules. Between these limits, each specific way of life spans a narrower range: for example, flying animals have had wing-spans ranging from the order of one millimetre (in the smallest wasps) to the order of ten metres (in the largest of the extinct pterosaurs).

Most of us retain our naïve sense of wonder at the sizes of living things, and many biologists have thought about sizes. What principles determine the ranges of size that are consistent with success in different ways of life? Why are there no gigantic insects and no microscopic birds? Why do all multicellular animals, from tiny nematode

worms to whales, have cell of about the same size? Tom McMahon (an engineer) and John Tyler Bonner (a biologist) have written a remarkable book - both absorbing and accessible. Although it is primarily intended for general readers, it should be of special value to biology students, because of the simple, thorough exposition of the principles of allometry and of dimensional analysis.

Allometry deals with the changes of proportions which accompany changes of size. For example, cats have relatively larger brains and eyes than lions. Brain mass, in mammals generally, is about proportional to the two-third power of body mass. Although allometry has long been taught to biology students, McMahon and Bonner's account moves exceptionally carefully from step to step, trying to ensure that everything will be understood. Dimensional analysis is a powerful aid to formulating equations that will apply to systems of all sizes. It is a fairly new tool in biology, and I know of no other book that introduces it so thoroughly or so well in a biological context.

Later chapters discuss the limitations imposed by size, on large organisms and on small ones. How does size affect their ability to run, jump, swim and fly? The discussion concentrates on mechanical constraints, with remarkably little on problems of diffusion or of heat and water balance. A stimulating final chapter considers ecological correlates of size. How do population densities, reproductive rates and species diversity relate to the size of organisms?

The book includes a fairly full account of McMahon's elegant but controversial theory of elastic similar-

ity. Roughly speaking, this theory says that terrestrial animals and trees are so proportioned that related specimens of different sizes tend to be under exactly the same geometrically similar loads. For trees, this would seem to be reasonably plausible, although gales may exert larger forces on them than gravity. For animals, however, it would seem to be much less plausible, because sagging seems not to be a problem for them. Also, peak forces on their bodies are not simply proportional to body weight: elephants cannot leap like gazelles. The theory also predicts that larger animals will be relatively stockier in build, according to a particular rule. However, although data from some groups of mammals (notably the antelopes and their relatives) follow the prediction well, data from other groups do not. McMahon and Bonner have been unfairly selective in their choice of evidence.

This book will give great pleasure to a wide variety of readers. It should give them a much deeper understanding of why living things are the size they are. It is beautifully produced and full of (mainly colour) illustrations, most of which are apt and interesting. Many make points dramatically, although just occasionally the editor seems to be struggling to find the appropriate picture for a particular page. British readers will also be surprised and possibly nudged by the variety of units in the book. As well as the familiar SI units they will find kilocalories per day, dynes and even horsepower and knots.

R. McNeill Alexander

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Physical analogues

Random Walks in Biology
by Howard C. Berg
Princeton University Press, £14.30
ISBN 0 691 08245 6

In this monograph, Professor Berg shows how a consideration of the random movements of small entities (for example, molecules, organelles and cells) can lead to an understanding of such processes as diffusion, sedimentation, electrophoresis, chromatography and cell locomotion. As a common feature of all the phenomena discussed is diffusion, a process in which individual particles in a liquid execute random walks on account of their thermal energy, Berg devotes considerable space to various aspects of that process.

By its very nature, a random walk complies with statistical principles, and the author shows how these principles can be used to gain an understanding of the physical basis of many important biological phenomena. For example, chapter two clearly demon-

strates that even when many different types of receptor exist on a cell surface, the chance of a "triggering" molecule colliding with its receptor can be close to that which would obtain if the whole surface acted as the receptor. Again, the importance of bacterial tumbling in chemotactic responses is succinctly presented in terms of a biased random walk (chapter six).

The treatment is quantitative, but not heavily mathematical; emphasis is given to the physics of a situation rather than to rigorous mathematical analysis. However, although the book could be read and understood by those with a limited mathematical background, to derive maximum benefit would require a working knowledge of elementary calculus. Indeed, the liberal sprinkling of equations in the text is indicative of the analytical and quantitative nature of modern biology. Those who find mathematical equations somewhat daunting would therefore do well to read this book, as the physical and biological significance of each one is clearly defined. A distinctive feature is the emphasis placed on the application of results to real biological situations; it is indeed difficult to find an example of a theoretical observation with no immediate experimental applicability. This aspect is of tremendous value in

supporting the worth and usefulness of physical concepts applied to biology. The constructive use of physical analogies of biological systems is also demonstrated - for example, diffusion through apertures in a wall is modelled by electric currents in a resistor network. The elegant simplicity of this modelling technique can be readily appreciated, the reader being led naturally to the consideration that similar models may be of benefit in the study of other biological phenomena. Professor Berg also shows how digital computers can be helpful to the biologist, by presenting simulated biased random walks and statistical distributions.

The book is eminently readable. The language used can be easily understood and there is ample evidence of the author's ready wit. The topics presented have a bearing on most aspects of modern biology with respect to both biological behaviour and the techniques used to investigate it. Anyone with a genuine interest in biological science would find the book entertaining, instructive and stimulating.

M. E. J. Holwill

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Fish out of water

The Colonisation of Land: origins and adaptations of terrestrial animals
by Colin Little
Cambridge University Press, £55.00
ISBN 0 521 25218 0

Colin Little's book provides a much needed review of the physiological and evolutionary problems of the water/land transition, drawing information from throughout the animal kingdom.

In recent years, there have been diverse studies on the comparative physiology of adaptations to the terrestrial way of life, which are in a sense a microcosm of the way in which, for example, zoological research tends to be subdivided into research areas. As a result, we often tend to beaver away in our own disciplines and remain unaware of developments in different but related fields elsewhere. It takes considerable effort to break out of this mould and tackle themes, such as this, more synthetically. Indeed, the task may become too daunting because of the sheer bulk of literature. Nevertheless, Dr Little has come to grips with this problem.

The great mass of data is presented

in the first nine chapters, which attempt to review the anatomical, physiological and behavioural traits displayed by all the groups of the animal kingdom that have terrestrial representatives. The physiological data is summarized at the end of each chapter and the various constraints that may have governed the evolution of terrestrial members of the groups concerned, from either fresh water or marine ancestors, are considered. All this information is then assimilated in the final chapter on the evolution of terrestrial ecosystems.

Little concludes that most terrestrial groups of invertebrates evolved from marine ancestors which were tolerant of variability in their environment (primarily osmotic variability) and in a sense preadapted for the variability in environmental conditions that prevail on land. By contrast, freshwater forms tended to develop high levels of homeostatic control (ionic) which are not suited to the variability of conditions in terrestrial habitats. Those groups which seem to have evolved from freshwater ancestors (prosobranch molluscs and decapod crustaceans) do not have very diverse terrestrial representatives.

This general observation contrasts markedly with the apparent situation in the vertebrates, which may well have evolved from freshwater forms. Despite the fact that terrestrial verte-

brates originated in freshwater and show a general lack of tolerance to variability in environment (favouring sophisticated homeostasis) the development of "special features" - for example, the amniotic egg, impermeable skin, respiratory ventilation in the amniotes (reptiles, birds and mammals) - has enabled them to colonize truly desiccated environments.

This book is a valuable synthetic review of the problems of the colonization of land by animals. Though ridiculously expensive, it would make a very useful reference for bright sixth-form or undergraduate biologists taking courses in whole-animal biology and physiology.

David Norman

David Norman is lecturer in zoology at Brasenose College, Oxford.

Entomology: a guide to information sources by Pamela Gilbert and Chris J. Hamilton has been published by Mansell at £18.00. Intended only as an introduction, the book is arranged by subject instead of systematic group. There is no attempt to be completely comprehensive: references are made only to standard texts (books, monographs, review articles and other publications where specially pertinent).

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William C. Stebbins

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CHEMICAL ECOLOGY OF INSECTS

Edited by W. J. Bell, University of Kansas
and R. T. Cardé, University of Massachusetts, Amherst

This book discusses the mechanisms involved in chemical signaling, the major mode of communication among animals. The subject of insect chemical ecology is possibly the most interdisciplinary topic in the life sciences today, including interactions among individuals of a species as well as in interactions of a species with food plants, parasites, predators and the physical environment. The interdisciplinary nature of the subject is reflected in this book which brings together the level of cell physiology, molecular biology, the level of the organism and social behavior. Each chapter is written by an international authority in the field, and the whole book is integrated to provide a thoughtful and well rounded summary of current knowledge.

March 1984, 450 pages illustrated
Hardback 0 412 23280 7 £30.00

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T. W. Goodwin, Johnston Professor of Biochemistry, Liverpool University

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This gee-whiz account of unexplained mysteries of science cannot be recommended at any level.

J. D. Pyle

J. D. Pyle is professor of zoology at Queen Mary College, London.

BOOKS

BIOLOGICAL SCIENCES

Staring back at you

Primate Social Relationships: an integrated approach
edited by Robert A. Hinde
Blackwell Scientific, £26.00 and £13.80
ISBN 0 632 00999 3 and 01002 9

Scientists are supposed to look at things. Most of science, instead, involves looking past things. We dissolve real objects into transparent collections of entities imagined at some lower level of analysis, or group objects into populations amenable to statistics at a higher level. This paradox is particularly acute in the study of primate behaviour. There stands a she-baboon, glowering at the scientist with chestnut eyes under grizzled brows. She scratches her roseate bottom with her fingernails. The scientist stares back in delight, then writes a paper on the genetic fitness of matrilineal baboon population structure.

Robert Hinde deals with this paradox with his usual clarity. He offers us a simple conceptual framework. Primates are individuals. The raw data of behavioural study are observed interactions between individuals. A series of interactions may build up social relationships, which in turn combine as the network of social structure. We may explain our observations in causal, developmental, functional or evolutionary terms. The type of explanation inevitably influences choice and perception of data, but it can never reduce data at one level to data at another. A social structure has complexities which just do not exist within a single individual or relationship.

Put so baldly, this sounds obvious. What is not obvious is that Hinde and his 19 collaborators actually keep all the levels and explanatory types in mind, as equally valid aspects of the same truth. *Primate Social Relationships* contains personality descriptions of monkey character; effects of orphanhood on infants; effects of in-

fant's sex on the time interval to their next sibling's birth; the development of dominance rankings during play; and the evolutionary consequences of competition between whole matrilineal groups. The professional primatologist needs to buy this book for the richly detailed information alone.

From the broader viewpoint of anyone interested in behaviour, the book shows how such a many-sided approach illuminates one particular kind of monkey society. The authors concentrate on baboons, macaques and vervets. In these species, daughters nearly always remain with their mothers' troop. In fact, the mother aids her daughters, especially whichever one is currently just maturing, as though she were calculating that the youngest daughter had highest reproductive value, with most babies yet to come. This means the troops have fairly rigid structure: daughters take dominance ranks just below their mothers, while younger daughters outrank their progressively older sisters. Where food is so clumped or drinking places so limited that dominant individuals or matrilineal troops can exclude less dominant ones, female aristocrats reproduce more, while subordinates are more likely to die or lose their infants.

Young males, in contrast, usually leave their natal troop, which reduces the risk of inbreeding. In some rhesus groups it seems that the mothers' rank is the main influence on age of leaving — younger for subordinates, late or not at all for dominants. Adult males do not throw out the youngsters; indeed, a juvenile of any lineage often has a special grooming relationship with a particular adult male, who may be his mother's current friend and consort, and sometimes even his own father. An adolescent does not simply go out to make his own way in the world. He migrates, if possible, to join an elder brother or in company with age-mates who are probably paternal half-brothers. Adult males also change troop, especially at the age when their own daughters are maturing. These adults are less dependent on support from kin, but they form mutual-aid alliances with male friends in their new troops. They do not forget their previous friends and relatives; the patterns of male emigration moderate group hostility, at least among vervets.

The final section of the book adds much needed perspective. These matrilineal, multimale troops are rare even among monkeys. Many primates live in monogamous pairs; many in harems. Even apparently similar groups may have differing internal structure. Hamadryas baboons form true harems of unrelated females. The male assembles and herds his wives

and bites them hard on the back of the neck if they stray. Gelada baboons live in similar groups but the females are matrilineal, socially bound to each other, while tolerating their rather extraneous male. The matrilineal groups of elephants act, in many ways, more like gelada baboons than geladas act like hamadryas.

Primate Social Relationships is an instantly valuable source book on particular monkey societies. It will and should become much more, as it provides a framework and worked model for the analysis of society, without losing sight of the individuals who are staring back at you.

Alison Jolly

Alison Jolly is at the Griffin Laboratory of the Rockefeller University, New York.

Adaptive patterns

The Study of Animal Behaviour
by Felicity Huntingford
Chapman & Hall, £24.50 and £10.95
ISBN 0 412 22320 1 and 22330 9

The main impression that Felicity Huntingford's book gives is of all-round strength and competence. This is the kind of book to which you could happily refer your students for a balanced and thoughtful account of almost any aspect of contemporary ethology.

This is not to say, however, that it is always exciting or challenging. Indeed, Huntingford's obvious determination not to shirk the more difficult techniques of data analysis or the objections to currently popular ethological models makes for a book that needs to be read slowly and pondered. It is certainly not a book to be skimmed through by readers wishing for no more than a quick introduction to ethology.

The book begins by putting ethology in its historical context and by showing how present-day ethology stems from Lorenz and Tinbergen's classical work. This is followed by a particularly useful chapter on the description and measurement of behaviour, topics that so many textbooks take for granted. There is, however, a great deal that has to be explicitly taught about the selection of units of behaviour and about techniques of data analysis. Indeed, Huntingford is not afraid to explain complex multivariate techniques, such as principal components analysis and the use of information theory in sequence analysis. Moreover, she takes pains to show how these techniques can help rather than impede our understanding of behaviour — a point that some of today's more mathematical ethologists would do well to note. What is more, she very properly warns the reader of the dangers of using such techniques indis-



Sacrificial scene on the Antonine Wall, Scotland, A.D. 143, from *Sheep and Man* by Ryder, published by Duckworth at £55.00.

criminately in the vain hope that something interesting will emerge. Quoting a delightful comment from I. C. Pielou: "It is a delusion to suppose that mysterious mathematical manipulations will reveal a full blown theory lurking unsuspected in a modest column of numbers."

The remaining chapters cover all the standard topics in ethology: causation, development, the adaptive significance of behaviour, phylogeny, behaviour genetics and applied ethology. With the first of these topics, causation, authors always have to face the problem of how much underlying physiology to teach. Huntingford solves this neatly by setting up a few key examples, such as the control of escape movements in the crayfish, of song production in canaries, and of prey catching in toads. By doing this, she is able to illustrate some important principles and also to show the ways in which behavioural and physiological research in tandem can be mutually beneficial.

In the longest chapter, on the adaptive significance of behaviour, it is especially refreshing to see a thorough discussion of the evidence that biologists use to make judgments about the adaptiveness or otherwise of be-

haviour. The chapter starts with the evidence quoted in Pielou's claim that a given behaviour amounts to little more than a function of faith in the ubiquity of natural selection. But many cases in which this is possible, on its own merits, that a given behaviour is of significance.

Although the chapter goes on to deal with optimality theory, sexual selection, and several other major topics, Huntingford does not let the reader from being swept up in her enthusiasm. She asks what are the weakest approaches; what alternative theories are there for the same results; and what inference really draw.

In many ways this book is a gem. It is a gem, not a trite, trite and rather bland textbook that is common to many.

N. R. Chalmers

N. R. Chalmers is reader in the Open University.

BOOKS

BIOLOGICAL SCIENCES

Lessons of prehistory

Human Ecology: the story of our place in nature from prehistory to the present
by Bernard Campbell
Heinemann, £12.50 and £6.95
ISBN 0 435 60140 7 and 60141 5

Why study the past? To fill museums with stones and bones? To discover people living in ways fascinatingly remote and different from ours (or depressingly similar)? Or because it's useful? According to Bernard Campbell the study of human evolution and prehistory is directly relevant to us as we hurtle towards demographic and ecological disaster.

His book has two basic aims. First, to place the current problems of man into the long-term context of prehistory. And second, to demonstrate that both in the past and today the pattern of human development is subject to ecological principles; that despite the uniqueness of culture and technology as the mode of adaptation, humans have always been constrained by the population-resource equation. Simply and readably he maps out these points by describing the structure and resources of the world's biomes and

their role in shaping human evolution. For each, Campbell provides examples of prehistoric, historic and contemporary human adaptation, moving from the tropical forests where the early primates flourished, to the savannas where distinct hominids emerged, to the colder latitudes they later colonized. Humans gatherers figure prominently in these chapters, which are followed by ones that look in detail at the consequences of pastoralism, agriculture and urbanism.

Campbell discerns three broad ecological trends in prehistory: an increase in free energy harvested from the environment; increasing trophic diversity; and increased dependence upon stored and transported energy. Human success in occupying more and more habitats at higher and higher population densities derives from these. This conclusion might indicate a rosy future. What has been good enough for the past two million years ought to be good enough for the twenty-first century. Unfortunately this is not to be.

According to Campbell, continuation of these trends is now incompatible with basic ecological constraints. Two factors are responsible for this. First, each development in prehistory had ecologically detrimental consequences. For example, harnessing water through irrigation led to increased salinity and desertification. With each advance the productivity and resilience of the ecosystem has declined. And second, because resources are finite there is an inherent limit to development, within which population growth must be kept. In the past the balance has existed; now, population increase is too great. Here lies the principal moral of prehistory. Earlier populations always regulated them-

selves, to maintain a harmonious relationship with their resources. And yet, is this actually the case? Were prehistoric people really so demographically stable? There is surely a cybernetic law waiting to be discovered stating that the equilibrium of a system is inversely proportional to the amount of data available. The equilibrium of Pleistocene man is an artefact of the sparsity of data on human adaptation. Certainly much of the ethnographic and archaeological data that Campbell cites relating to the case and character of hunter-gatherer adaptation has recently been questioned. Indeed, it may be argued that human adaptation during the Pleistocene was highly unstable, for only under such conditions would selection be intense enough to result in the radical changes associated with becoming human. Furthermore, lack of population growth may equally be evidence for harsh Malthusian checks or harmonious regulation.

However, Campbell's argument that humans are subject to ecological constraints does not depend upon the contrast between prehistoric harmony and modern instability. A stronger case is that mankind has faced constant environmental and demographic problems during their evolution. The lesson of prehistory is that natural selection has been intense enough to produce radical solutions that are consistent with ecological principles but not intense enough to cause extinction. This cannot be guaranteed in the future.

Robert Foley

Robert Foley is lecturer in physical anthropology at the University of Durham.

Nerve, muscle, synapse

Test Your Understanding of Neurophysiology
by R. W. Murray
Cambridge University Press,
£25.00 and £8.95
ISBN 0 521 24999 6 and 27127 4

The study of neurophysiology presents a daunting task to many undergraduates in the biological sciences because of its firm foundations in physics and chemistry. As a result many students attend to the structural and behavioural aspects of the field, allowing minimal intrusion of physicochemical concepts and thus avoiding the reductionism necessary for a proper understanding of neurophysiology at system and holistic levels.

How then can undergraduates deficient and perhaps even uninterested in the physical sciences be encouraged to gain a basic knowledge of physics and

chemistry so essential to the study of nervous structure and function and the neural basis of behaviour? Dr Richard Murray, an experienced lecturer in zoology and comparative physiology, is well aware of this problem and has sought a resolution in quite novel fashion. His textbook not only tests but reinforces and unifies knowledge of neurophysiology. His book will certainly be a valuable teaching aid for students, postgraduates as well as undergraduates.

Part one considers basic principles: elementary electricity, physical chemistry of excitable cells; and recording techniques. The first two chapters, on electricity, are extremely well-written, precise and concise, and interesting throughout. Chapter three, however, on physical, chemical and membrane potentials, though a useful introduction to a difficult area, is too skeletal for most undergraduates. The final three chapters then provide a useful introduction to electrophysiological techniques. Although the approach in these chapters is inevitably selective, leaving the reader ignorant of many important techniques in neurobiology, they do act as a useful bridge between basic electrical principles and electrophysiological concepts.

Part two contains problems based

mainly on published research, with instructions for their solution. Sense organs, nerve and muscle cells, synapses and techniques are covered comprehensively and comparatively. However, although I would not wish to challenge the correctness of the author's answers (part three of the book), I have some doubts as to the ability of many undergraduates to grasp without further tuition, the importance of the minor, and less minor, qualifications that they contain.

I can thoroughly recommend this book to undergraduates in biology and medicine and to new postgraduates in neurophysiology. They will find it both informative and a pleasure to read. It provides a comparative approach should help readers to appreciate the unifying principles underlying nervous structure and function in invertebrate and vertebrate animals and perhaps erode the artificial barrier that exists between medical and non-medical neurophysiology.

P. N. R. Usherwood

P. N. R. Usherwood is professor of zoology at the University of Nottingham.

Hormone action

Endocrinology
by Mac E. Hadley
Prentice-Hall, £31.30
ISBN 0 13 277137 3

The arrival of this comprehensive and up-to-date text will be much appreciated by all those involved in the undergraduate teaching of endocrinology, particularly as most other textbooks in this field are either restricted in coverage or are at least five to ten years out of date. Hadley has incorporated many recent concepts and theories, and he has intentionally avoided the classical distinction between endocrine and neural physiology.

The central theme of the book is the role of blood-borne chemical messengers (hormones), whether of classical endocrine or neural origin, in the regulation of physiological processes. Early chapters review historical developments in endocrinology and consider modern techniques and experimental methodologies. Hadley discusses in detail current views of the mechanisms of hormone action and the events following hormone arrival at target cells; examines the role of

receptor affinity and number in governing the extent of hormone action; and assesses the importance of a hormone's ability to influence not only the receptor number on its own target tissue but also the number of receptors for other hormones on their target tissues.

A detailed survey of the vertebrate endocrine system in subsequent chapters is largely achieved through analysis of the control of particular physiological functions, including calcium homeostasis, the varied aspects of metabolic homeostasis and reproduction. Sufficient detail of each physiological system is presented to enable adequate assessment of the role and importance of specific hormone action. A final chapter appropriately considers the functions of the recently discovered neurohormones, particularly opiate-like peptides, other brain peptides, and gastrointestinal peptides.

Each chapter follows a similar pattern, reviewing endocrine synthesis, chemistry, secretion and metabolism, hormone physiological function, and mechanism of action. Clinical consequences of endocrine malfunction are also outlined together with a brief survey of homologous endocrine function in non-mammalian vertebrates. The book is generally well illustrated: many of the figures are either originals or are now to undergraduate textbooks. The text is unusually consistent across

the range of hormones considered in both level of detail and level of appraisal of current knowledge — not only a tribute to the author but also to the formidable list (over 30) of specialists who reviewed parts of the book before publication.

As primary consideration throughout the text has been given to mammalian physiology, particularly human, the book will be most valuable to students of medicine, dentistry, pharmacology and other medically-related disciplines. None the less, the comprehensive nature of the text (and the (albeit limited) coverage of comparative endocrinology should also ensure its wide use by undergraduates in the other biological sciences.

R. J. Balmert

R. J. Balmert is lecturer in zoology at the University of Manchester.

Third editions of some well-known textbooks have been published: Knut Schmidt-Nielsen's *Animal Physiology: adaptation and environment* is available from Cambridge University Press at £15.00; Mason E. Hale's *The Biology of Lichens* is available from Edward Arnold at £9.95; and Peter Bell and Christopher Woodcock's *The Diversity of Green Plants* is available from Edward Arnold at £9.95.

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Structure, Function and Assembly
by S. M. Danks, Biology Tutor, Open University, E. H. Evans, Department of Biology, Preston Polytechnic and P. A. Whitaker, Department of Biology, St Patrick's College, Maynooth, County Kildare
Whilst the coverage of this book is primarily photosynthesis in green plants, additional comparative material is included on bacteria and algae where photosynthesis takes place, the intention being to present a comprehensive and up to date overview. References to research techniques are included throughout the text, and a suggested reading list is provided at the end of each chapter to aid the more advanced student to further reading.
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R Robin Baker

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Events in the embryo

Cells into Organs: the forces that shape the embryo (second edition)
by John Philip Trinkaus
Prentice-Hall, £28.45
ISBN 0 13 121632 5

To those who are not familiar with the work of Dr Trinkaus, a leading researcher in the field of developmental biology, it will come as a surprise to learn that this book is almost exclusively concerned with cell movement. Although there can be little doubt that cell movements do indeed play a most important role in embryogenesis, especially in gastrulation (one of the earliest periods of development), they are by no means the only forces at work. Embryonic induction, bursts of mitosis, localized patches of cell death all have their parts to play.

The emphasis on cell involvement as a force in development is a relatively new one, and probably owes its time-lapse cine-photography than to the more slowly moving, but more dedicated, of microscopists. Indeed,

over a microscope for many weary hours would find them impossible to follow. For example, Trinkaus reports that if epithelial cells are taken from the tail of the larva of the frog *Xenopus* and grown in tissue culture, they move "rapidly" — by this he means at a rate of only 10 to 20 micrometres per minute.

Despite the assistance of time-lapse cameras in speeding up the process, it is not easy to study cell migration in complex three-dimensional systems. Even early embryos present technical problems except at very low powers of magnification. It is not surprising therefore that so much of our knowledge about the locomotion of individual cells comes from studying artificial conditions *in vitro*. Indeed, these cellular monolayers have proved such exceptional and beautiful subjects for filming that many investigators have fallen so much in love with them that they have given up all pretence at any interest in events in the whole organism. If we are at last beginning to progress beyond this sorry state of affairs, then Dr Trinkaus deserves much of the credit, for he has always understood that tissue culture is not an end in itself but at best an approximation of events in the embryo. This message came through loud and clear in the first edition, and does so even more in the second — which between the length, there is much here that is new. Two subjects that received little treatment in the first edition — the molecular

structure of the plasma membrane, the spread of malignant cells — merit chapters of their own in the rest of the book has been re-worked. For example, phagocytic movements are discussed in more detail than in the first edition. The present, however, remains the same: a late research — rather than a survey of its current state.

The emphasis, therefore, is on what remains to be done and has already been done. Unsurprisingly for advanced students and researchers in other fields, this book was, according to the author, "empirically not well received". It might explain why he has skimped so much on the references. A short list of selected references at the end of each chapter does not detract from the value of the book. The subject index too leaves something to be desired, and the author writes sometimes faintly.

These grumbles apart, however, this is a valuable, though individual, one. I happily recommend it, even to researchers working in

Ruth Bellairs

Ruth Bellairs is professor of zoology at the University of Cambridge.

0340 33416 9

BOOKS

BIOLOGICAL SCIENCES

Rays of opal in the oceans

Radiolaria
by O. Roger Anderson
Springer, DM159.00
ISBN 3 540 90832 3

Vast tracts of the deep ocean floor, below the horizon at which calcareous shells dissolve, are covered by a grey ooze composed almost entirely of the microscopic, siliceous skeletons of diatoms and radiolaria. Each gram may contain as many as 10,000 radiolarian shells (frustules), each one being the product of a single-celled animal (a protozoan) which once lived in the plankton of the ocean waters above. The radiolaria are truly remarkable. Although most live as separate, individual, free cells, ranging in size from 0.2 to 20 millimetres, some form colonies up to 20 metres in length. They are most abundant in the surface waters of the oceans (up to 16,000 individuals in a single cubic metre), but they can inhabit all depths, even to the abyssal. Their wonderfully constructed frustules are built of spicules of glassy, opaline silica, fused into lattices of complex pattern, ordered symmetry and great beauty. In some, the radiating spicules resemble three-dimensional, lacy snowflakes; others have polyhedral lattices, like geodesic spheres, yet others build upon upon concentric spheres, supported by radiating glassy spines. Even more elaborate are those with bipolar symmetry, where ovoids of latticed spicules surround triffid-like tips. Regardless of their elaboration and complexity, each species reproduces its characteristic skeletal pattern precisely, generation after month-long generation. One hundred years ago, Ernst Haeckel filled three volumes of the *Challenger* reports with descriptions and fine drawings of over 4,000 radiolarian species; now, over 6,000 fossil species have been recorded and about 400 are believed to live in today's

oceans. Particular communities of species inhabit different oceanic water masses, varying both with depth, in the stratified ocean, and biogeographically, in the surface waters. No species is cosmopolitan; each has its own preferred oceanic environment. Oceanographically, the radiolarian species are distributed according to variations in the qualities of the oceanic waters. In the geological record of ancient sediments, sequences of successive evolutionary stages imply progressive evolution towards increasing structural complexity or to simplification, differing in different lineages. Reconstructions of Quaternary palaeoclimates have been aided by the record, in oceanic sediment cores, of latitudinal oscillations in the position of polar and subpolar fronts, revealed by the immigration and emigration of radiolarian assemblages during Pleistocene and early Holocene periods.

However, it is only in the past few decades that we have begun to understand the nature of the living animal. O. R. Anderson writes authoritatively, for it is his research which has contributed most to our knowledge of the biology of the radiolaria. His book is comprehensive, well ordered and copiously illustrated, and is supported by a well integrated survey of micropaleontological evidence on the evolutionary, phylogenetic significance of radiolarian frustule development. Cytological study has revealed that the radiolaria are among the most advanced of the protozoa; their cytoplasm is more clearly differentiated into areas of specialized function than in the foraminifera, their nearest rivals on the ladder of marine protozoan development. No longer can one envisage radiolaria as passive herbivores, grazing innocently on phytoplankton; their shimmering haloes of sticky pseudopodia actively capture and dismember small crustaceans, ciliates and other prey. They can even clean themselves of the unwanted residual particles of the unutilized food. They are bioluminescent, emitting repeated flashes of blue light, thus probably discouraging predation. They can adjust their buoyancy to migrate vertically within the water column, especially necessary when their stores of photosynthetic symbionts need particular levels of illumination.

Much is still to be learned about the mechanism of frustule secretion: how can solitary cells create such remarkably complex skeletal structures? What selection factors in phylogenetic, evolutionary history have influenced their creation and design? The skeleton does, however, remain as a physical record of cell pattern production, and its development could well

reflect that of cellular control mechanisms. Answers to these questions could lead to progress in understanding fundamental cell processes, pertinent to a wide variety of organisms. The study of the radiolaria has implications beyond the sciences of marine biology and micropaleontology, even though it is fascinating in its own right. What insight Johannes Müller showed, when he predicted to the young Haeckel in 1854, "As soon as you have entered into this pelagic wonderland, you will see that you cannot leave it!"

F. T. Banner

F. T. Banner is emeritus professor of oceanography at the University College of Swansea, and visiting professor in the department of geology at University College London.

Selective neutrality

The Neutral Theory of Molecular Evolution
by Motoo Kimura
Cambridge University Press, £35.00
ISBN 0 521 23109 4

Until relatively recently, evolutionary biology has been concerned primarily with morphological change. At this level there is abundant evidence that natural selection is of primary importance in controlling the evolution of the phenotype, the observable characteristics of an organism produced by the interaction of genes and environment. After R. A. Fisher showed that quantitative variation in a morphological character could be understood in the light of Mendelian genetics, a consensus gradually emerged among evolutionary biologists during the first half of this century that the genetic processes occurring in natural populations could be understood solely in terms of the action of natural selection. Those instances where specific alleles (any one of the alternative forms of a gene) were shown to have a major effect on fitness through the changes in morphological phenotype, such as melanism in the peppered moth, shell colour in snails or mimetic colour polymorphisms in butterflies, confirmed this consensus. Against this background, the first data on amino acid sequence in proteins from various organisms began to accumulate. Overall, these sequences showed remarkable concordance with other taxonomic characters.

Species classified as closely related on morphological criteria showed lower sequence differences than ones more distantly related. However, by 1968 it was becoming apparent that, although the pattern of protein and morphological evolution was similar, the rates were not: morphological evolution is characterized by great changes in rate, protein evolution shows a remarkable constancy. About the same time, the first applications of the biochemical techniques of electrophoresis to the study of genetic variation in nature had revealed far higher levels of variability than had been anticipated.

Motoo Kimura had come to prominence in the field by virtue of his application of the mathematical techniques of diffusion approximation to the study of alleles in small populations. Following Sewall Wright, he proposed that natural populations are generally small enough for random sampling to have a significant effect on allele frequencies. Kimura's model was realistic in the light of what was known about the genetic code, and the elegance of the theory, under which each allele is selectively equivalent, or "neutral", has been an attractive feature.

According to Kimura's model, the level of variation in a population can be predicted, given only the population size and the mutation rate. After the discovery of the high level of variability in natural populations by electrophoretic techniques, Kimura proposed that this could be more readily explained using the hypothesis of selective neutrality than by the suggestion that selection was maintaining several different allelic forms of many enzymes in natural populations. He subsequently noted the constancy in the rate of protein evolution and pointed out that this too would be easier to explain if most amino acid substitutions were neutral, because according to his model the average rate of substitution is equal only to the mutation rate.

In his book Kimura gives a full description of the neutral theory, which came to include several other models and contributions from many other population geneticists. He indicates its origins and provides a detailed defence against a large number of criticisms which have been raised against it. He also examines in detail the extent to which its predictions fit the large amount of relevant data now available. Kimura very clearly makes the point that the neutral theory is not "anti-Darwinian", but that it admits that the evolution of morphological phenotype is controlled by natural selection, the neutral theory therefore states that at the molecular level, especially at the level of the nucleotide (the base component of the genetic

code), individuals differ in number of alleles due to determined processes and random genetic drift help to reduce the selection on this topic.

Some difficulties with the theory are also admitted, but not per se, the theory would predict that possible explanations are extremely well worked out. However, as far as concerned several subjects with in one chapter under to in a later one, this is also not entirely surprising, after just introducing a new book, it is well up to date, having several of the important evolutionary studies, it is surprising that two such conversion between topics, and the evolutionary DNA molecules, most attention, this book is a contribution to the field.

As to whether the theory is correct, I think the answer comes from "provisionally duplicated copies of a structural protein, and globin, become inactivated. This has happened with genes in several different animals. It is universally true that the loss of function has been by a dramatic increase in the nucleotide substitution rate, "pseudogene" relative to its counterpart - a very strong evidence that high rates of change, variability, are associated with phenotypic effect and selective neutrality.

A. J. Leijh Brown

A. J. Leijh Brown is a Senior Lecturer in the School of Sciences at the University of Leeds.

A second edition of this book, *The Neutral Theory of Molecular Evolution*, by Motoo Kimura, Cambridge University Press, Oxford, 1983, is available.

A paperback edition of *The Neutral Theory of Molecular Evolution* by Motoo Kimura, Cambridge University Press, 1983, is available. Price, £12.50.

A paperback edition of *The Neutral Theory of Molecular Evolution* by Motoo Kimura, Cambridge University Press, 1983, is available. Price, £12.50.

As a result, outstanding teachership claimed by the "serius amateur" (and undergraduate) is likely to be book more valuable than the "undergraduate" and "immediate graduate", who might well be directly to more broadly-based, more detailed treatments of the subject areas.

Although *Return of the Serius* is centred on the reintroduction of the "serius" to the world of the "serius", it is also a monograph on the "serius" in the world of the "serius", and a monograph on the "serius" in the world of the "serius".

These early chapters form a background to the more detailed chapters, but sometimes the background is a little too detailed, and the more detailed chapters are a little too detailed. However, the book is a very good introduction to the world of the "serius", and a very good introduction to the world of the "serius".

I. J. Patterson

I. J. Patterson is senior lecturer in zoology at the University of Leeds.

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Universities

THE UNIVERSITY OF LEEDS



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Faculty of Economic and Social Studies

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Public sector microeconomics; in particular, the economic analysis of decision-making in local authorities and other regional public bodies. Closing date for applications: 5 May 1984 (ref. 31/3/DO).

GEOGRAPHY

Hydrology; medium scale modelling of near-surface water interactions. Closing date for applications: 1 May 1984 (ref. 32/18/DO).

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The politics of developing countries with particular reference to problems of international resource allocation. Closing date for applications: 15 May 1984 (ref. 34/9/DO).

Faculty of Education

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Technology education; the appointee will join the Centre for Studies in Science and Mathematics Education and will contribute towards the development of new technology within the school curriculum. Closing date for applications: 8 May 1984 (ref. 36/9/DO).

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BIOPHYSICS

Applications of computer graphics in studying the structure and function of biological molecules, molecular dynamics, molecular interactions and macromolecular assembly. Closing date for applications: 22 May 1984 (ref. 42/6/DO).

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Inorganic chemistry of the solid state; in particular, the synthesis and characterization of new materials and the properties of solid compounds. Closing date for applications: 8 May 1984 (ref. 44/20/DO).

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Theory of instabilities in chemically reacting open systems; mathematical interests and experimental experience an advantage. Closing date for applications: 29 May 1984 (ref. 46/18/DO).

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Analysis; some preference will be given to candidates with interests in Banach algebras and/or several complex variables. Closing date for applications: 1 May 1984 (ref. 51/3/DO).

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Physics of condensed matter; the appointment is in the area of amorphous materials with emphasis on metallic glasses and the appointee will join seven staff members concerned with experimental and theoretical aspects of these materials. Closing date for applications: 15 June 1984 (ref. 52/28/DO).

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Science of inorganic, porous powders prepared by novel routes for the production of advanced ceramics for electronic, mechanical engineering and coatings applications. Closing date for applications: 22 May 1984 (ref. 62/11/DO).

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Public Health Engineering; it is hoped to appoint a biochemist or microbial physiologist to undertake work on the treatment of domestic and industrial waste-waters. Closing date for applications: 8 May 1984 (ref. 64/34/DO).

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Coal Utilization; New technology for the efficient combustion and gasification of coal and coal liquid mixtures. Closing date for applications: 15 May 1984 (ref. 67/13/DO).

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Faculty of Medicine (Including Dental School)

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Biochemistry and Cell Biology; the research area is not specifically defined but the person appointed will be interested in the application of cell biology techniques to the study of biochemical problems. Closing date for applications: 22 May 1984 (ref. 83/55/DO).

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Imaging; introduction of digital techniques to medical imaging particularly in relation to digital X-rayology. Closing date for applications: 15 May 1984 (ref. 82/6/DO).

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UNIVERSITY OF OXFORD

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Anatomy (Department of Human Anatomy, South Parks Road, Oxford, OX1 3QX, Telephone Oxford (0865) 58888).

MATHEMATICS

Application of Differential Equations (Chairman of the Board of the Faculty of Mathematics, Mathematical Institute, 24-29 St. Giles, Oxford, OX1 3LB, Telephone Oxford (0865) 54295).

PAEDIATRICS

Paediatrics and Infectious diseases (Department of Paediatrics, John Radcliffe Hospital, Headington, Oxford, OX3 9DU, Telephone Oxford (0865) 817434).

PHYSICAL CHEMISTRY

Computational Chemistry (Physical Chemistry Laboratory, South Parks Road, Oxford, OX1 3QZ, Telephone Oxford (0865) 53322).

ZOOLOGY (Including Molecular Biophysics)

Development and Cell Biology (Department of Zoology, South Parks Road, Oxford, OX1 3PS, Telephone Oxford (0865) 56788).



Department of Chemistry

Lectureship in Organic Chemistry

Applications are invited for the post of Lecturer in Organic Chemistry (salary scale £7,190-£14,125 per annum) available from 1 October 1984. This is one of the New Blood appointments and the area selected for support is bio-organic chemistry.

Seven copies of applications giving a curriculum vitae and list of publications together with the names of three academic referees should be sent by 8 May, 1984 to Mr D. A. S. Copland, The University, Highfield, Southampton SO9 5NH, from whom further details may be obtained. Please quote Reference Number: 2039.

(14489)



University of Wales

ECONOMICS preferably micro/managerial LECTURER

Salary: £7,190 to £14,125 per annum

Requests (quoting Ref. B42) for details and application form to

Staffing Office, UWIST, PO Box 88, Cardiff CF1 3XA.

Closing Date: 4th May, 1984

(14489)

Costa Rican Natural History

Edited by
DANIEL H. JANZEN

"This is an extraordinary, virtually unique work that will make an important contribution to our understanding of tropical biology not only in Costa Rica but throughout the world. The tremendous amount of original, previously unpublished, first-hand information is remarkable". Peter H. Raven, Director Missouri Botanical Garden.

More than two thirds of all species of living things are found in the tropics. This splendidly illustrated compendium of information explores its rich biological diversity.

The major section of the book consists of detailed discussions of agricultural plants and animals, natural insects of Costa Rica. Each chapter includes a comprehensive introduction with a detailed list of where available. Over 300 species are examined at length, behaviour, habitat requirements and life history. Lists of references and photographs or drawings accompany the species accounts.

832 pages with 306 halftones and 54 figures
Hardback £42.50 0-226-39332-1
Paperback £25.50 0-226-39334-8

CHICAGO

The University of Chicago Press
126 Buckingham Palace Road London SW1W 9SD

Strictly birds

Avian Ecology
by C. M. Perrins and T. R. Birkhead
Blackie, £19.95 and £9.95
ISBN 0 216 91478 7 and 91477 9
The Return of the Sea Eagle
by John A. Love
Cambridge University Press, £15.00
ISBN 0 521 23513 9

Books on birds fall into a number of main types, among them handbooks of birds of particular regions, monographs on single species or groups and general books covering a range of ornithological topics. *Avian Ecology* falls clearly into the last category.

Divided into a number of discrete topics, the book brings together a large amount of material on all those aspects of ecology and behavioural ecology which have received most attention from ornithologists. In two opening chapters on social behaviour the authors first contrast species and territorial breeding and then progress logically to behavioural aspects of breeding, mating systems, brood parasitism and cooperative breeding.

Some of the principal research interests in avian ecology, the factors influencing the timing of breeding and the size of the clutch, are discussed in detail in chapters four and five. The authors conclude, in spite of a number of criticisms, that the balance of evidence is heavily in favour of David Lack's hypothesis that in most birds young that the parents can rear successfully.

The limitation of population size in birds has been the subject of a number of important long-term studies, and some of these and their theoretical backgrounds are outlined in chapter six, with emphasis on density-dependent effects in the regulation of density. However, the case-studies cited (great tit, black-and-white manakin and puffin) are presented very briefly indeed, and the book might have benefited from the inclusion of more such studies discussed at greater length.

The last three chapters deal with the interconnected topics of inter-specific competition, foraging behaviour and migration, all of which have been extensively studied in birds. There is no separate concluding chapter, a symptom perhaps of the way in which ornithology has grown on a number of divergent fronts, difficult to bring together in one cohesive theoretical framework.

The breadth of this book makes it an excellent source of reference for the serious amateur ornithologist wishing to learn about scientific ornithology, as it gives a very useful summary of the key ideas, hypotheses and principal examples. The figures and tables are simple, so that the message is easily absorbed. Such a wide scope, however, in a rather small book has limited the coverage of most topics to a brief résumé of the main points (though published work), and there are many very short sub-sections of only a few lines.

The restriction of a book to one taxonomic group, even a well-studied one, inevitably restricts its use by students of general ecology. Topics such as migration and foraging theory are important without mention of

insects. As a result, outstanding teachership claimed by the "serius amateur" (and undergraduate) is likely to be book more valuable than the "undergraduate" and "immediate graduate", who might well be directly to more broadly-based, more detailed treatments of the subject areas.

Although *Return of the Serius* is centred on the reintroduction of the "serius" to the world of the "serius", it is also a monograph on the "serius" in the world of the "serius", and a monograph on the "serius" in the world of the "serius".

These early chapters form a background to the more detailed chapters, but sometimes the background is a little too detailed, and the more detailed chapters are a little too detailed. However, the book is a very good introduction to the world of the "serius", and a very good introduction to the world of the "serius".

I. J. Patterson

I. J. Patterson is senior lecturer in zoology at the University of Leeds.

Universities continued

University of Exeter School of Education

Applications are invited for the following posts which are tenable from 1st October 1984. Candidates should be well qualified and have successful recent teaching experience in the relevant subject.

1. Lecturers in Primary Education - 2 permanent posts (Ref. no. 3363)

The persons appointed will be members of an expanding team of tutors involved in primary education in both initial and in-service teacher training. They will be expected to contribute to the general curriculum/professional components of the Primary (7 to 12 years) courses in BEA and PGCE and also to offer a particular strength in at least one area of the Primary school curriculum and to contribute to in-service courses.

2. Lecturers in Physical Education - 2 permanent posts (Ref. no. 3364)

The persons appointed will join a strong team of tutors involved in both initial and in-service training. The BEA course will admit both men and women students from October 1984. They will work with students of BEA and PGCE courses in both academic and practical areas and strong contributions will be sought in exercise physiology and related areas as well as in sociological and curriculum concerns. An ability to teach a range of practical activities, particularly racket games and team games including netball, will be expected.

3. Lecturer in Art Education - 1 temporary 2 year post (Ref. no. 3365)

The person appointed will become a member of a group of three tutors involved in the initial training of teachers on BEA and PGCE courses. He/she will be expected to teach painting, some art history, and art education in the Primary school.

Commencing salary for all posts will be within the range £7,190-£14,125 per annum with placement dependent on age and experience. Further particulars are available from the Personnel Office, University of Exeter, Exeter EX4 4QJ, to whom applications (seven copies) with the names and addresses of three referees should be sent by Friday, 27th April, quoting the appropriate reference number. (14822)

THE UNIVERSITY COLLEGE OF WALES ABERYSTWYTH

NEW BLOOD APPOINTMENTS:

Applications are invited for the following Lectureships funded under the U.S.G.'s 'New Blood' initiative. The posts are available from 1st October 1984, in accordance with the terms of the 'New Blood' initiative, candidates should normally be aged 35 or under and in the early years their primary role will be to contribute substantially to research.

DEPARTMENT OF APPLIED MATHEMATICS COMPUTATIONAL FLUID DYNAMICS

The successful applicant will be required to collaborate with a large research group in Non-Newtonian Fluid Mechanics, co-directed by Professor K. Walters and Dr A. R. Davies.

DEPARTMENT OF BIOCHEMISTRY AND AGRICULTURAL BIOCHEMISTRY PLANT BIOCHEMISTRY

With particular reference to the synthesis and assembly of membrane components. However, applicants with research interest in other aspects will be considered.

DEPARTMENT OF COMPUTER SCIENCE ROBOTICS

The successful applicant will support and strengthen the Department's research in the area of Software Technology for Advanced Industrial Robotics, continuing to develop research on intelligent control systems, particularly welcome. A background in Software is essential, and an interest in artificial intelligence is desirable, but relevant experience will be considered.

The salary for all three posts will be on the Lecturer Scale: £7,190 to £14,125 per annum.

Application forms and further particulars can be obtained from the Staffing Office, The University College of Wales, Old College, King Street, Aberystwyth, SY23 2AZ. Tel 0570 3177 Ext.207 Closing date for applications: 11th May, 1984. (14824)

nihe limerick

BUSINESS POLICY FINANCE ACCOUNTING MARKETING NEW ENTERPRISE DEVELOPMENT PERSONNEL MANAGEMENT

The College of Business plays an important role within the University, operating a wide range of activities including programmes at undergraduate and graduate levels, part-time courses and has an expanding applied research component. Recruitment is now being initiated for a number of important faculty positions at Senior Lecturer and Lecturer levels within the Department of Business Studies in the following areas:-

SALARY SCALES: SENIOR LECTURER: £12,703 - £20,742 p.a. LECTURER: £12,474 - £18,937 p.a.

Application material available from the Personnel Office, The National Institute for Higher Education, University of Limerick, to be completed and returned by 14 May, 1984.

Applicants are requested to indicate their area of interest.

THE UNIVERSITY OF PAPUA NEW GUINEA

Port Moresby

Applications are invited from suitably qualified persons for the following posts.

LECTURER/SENIOR LECTURER - OBSTETRICS & GYNAECOLOGY (P811010/84) Department of Clinical Sciences

Applicants should have postgraduate training and qualification in Obstetrics and Gynaecology as well as experience in teaching. Previous experience in Obstetrics and Gynaecology in a developing country is highly desirable. The appointee will be responsible, in association with other staff members, for teaching students in Obstetrics and Gynaecology at the Port Moresby General Hospital and will also be responsible for clinical supervision. Medical graduates must supply evidence of qualification and status for registration with Papua New Guinea Medical Board. Details will be sent on application.

LECTURER/SENIOR LECTURER IN EDUCATION (Curriculum) (P051008/84) Department of Education

The Education Department requires a Lecturer/Senior Lecturer in Curriculum (Curriculum) for a three year period from 1.7.84, to join a team offering a programme of in-service education to supervisory teachers in Primary School in Papua New Guinea. The programme is known as the Diploma in Educational Studies (Primary) and is taught as a residential course during the summer vacation (November-January) with supervised field work over the rest of the year. The latter involves extensive travel in Papua New Guinea. The person appointed will be responsible for the teaching of curriculum in the programme and will be expected to offer a course in curriculum development to the in-service 1114 programme. Successful candidates should have a higher degree in English Language Education, or a course in curriculum development in the in-service 1114 programme. They should also have postgraduate qualifications in curriculum development, preferably in developing countries, are required.

LECTURER/SENIOR LECTURER IN LANGUAGE EDUCATION (P051007/84)

The appointment for this post is for a 2 1/2 year period from July, 1984. The person appointed will be required to teach courses to pre-service 8 Ed. students undertaking a programme of initial teacher training, and to experienced language teachers following an in-service 8 Ed. programme. Participation in second language curriculum development work for Papua New Guinea secondary schools is also required. Candidates should hold a higher degree in English Language Education, or a course in curriculum development in the in-service 1114 programme. They should also have postgraduate qualifications in curriculum development, preferably in developing countries, are required.

LECTURER/SENIOR LECTURER/SENIOR TUTOR - (P821002/84 & P821007/84) Department of Language Studies - Goroka Teachers' College

The posts are tenable from July 1984 or from January 1985 by arrangement. Applicants should possess a degree in English or a related field together with higher degree or experience in TESL. For applicants for Lecturer/Senior Lecturer a higher degree is required. Successful candidates should have a higher degree in English, and teaching experience in a developing country, especially desirable. The Department provides Language Skills courses for Preliminary and Post-graduate students, as well as specialist courses in ESL, Methodology for students planning to teach English in the High School. Experience in designing, writing and teaching EAP, ESP or Service English courses would be a decided advantage. Applicants should attach a c.v. and a concise but adequate statement indicating their previous experience and current professional and personal qualifications and their suitability for the post. A contact phone and/or telex number should be provided where possible. The c.v. should contain a statement of research interests and experience and give some indication of when the applicant will be available to begin duties. To reduce postal delays applicants should request their referees to write directly to the College. Further information can be obtained from the Chairman, Department of Language Studies, Goroka Teachers' College, P.O. Box 1078, GOROKA, EHP, Papua New Guinea, or by telephoning 78-1366, Ext. 740.

Salary: £11-K1,217 at 10.3.84.

TUTOR

LECTURER GRADE 1/SENIOR TUTOR GRADE 1

LECTURER GRADE 2/SENIOR TUTOR GRADE 2

SENIOR LECTURER

Other Conditions: The successful applicant will be normally offered a contract for a three year appointment ending at the end of a semester. The gratuity entitlement is based on 24% of salary earned and is payable in instalments of one month's salary at a rate of 2% in addition to the salaries quoted above, the main leave is included; support for approved research; health insurance; accommodation; appointment and a copy of their application to the Association of Commonwealth Universities (ACU), 36, Bedford Square, London WC1H 0PF. Closing date for applications is 27 April 1984.

Applications for the positions at Goroka Teachers' College should be forwarded to the Assistant Registrar, Goroka Teachers' College, P.O. Box 1078, Goroka, East New Guinea, Papua New Guinea, and applications for all other positions should be forwarded to the Deputy Registrar (Staffing), University of Papua New Guinea, P.O. Box 320, UNIVERSITY, Port Moresby. Candidates should also attach a c.v. and a copy of their application to the Association of Commonwealth Universities (ACU), 36, Bedford Square, London WC1H 0PF. Closing date for applications is 27 April 1984.

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Applications for the positions at Goroka Teachers' College should be forwarded to the Assistant

Universities continued

University of Otago
Dunedin, New Zealand
LECTURER/SENIOR
LECTURER IN
EDUCATION

Applications are invited from suitably qualified persons for the above position in the Department of Education. Applicants will be expected to teach and carry out research in one or more of the following areas: computer, educational research, evaluation, research design and data analysis, special education, and educationally disabled persons. Well qualified applicants would be considered for appointment at Senior Lecturer level.

Salary: £22,500-£25,000 per annum. Lecturer: £22,500-£24,000; Senior Lecturer: £24,000-£25,000. This is a tenurable appointment.

Further particulars are available from the Secretary General, Association of Commonwealth Universities (ASCU), 38 Gordon Square, London WC1H 0PE. The Registrar of the University of Otago, Dunedin, New Zealand.

Applications close on 13 May 1984.

Heriot-Watt University
Department of Electrical and Electronic Engineering
LECTURER

The department provides BSc and MSc degrees in electrical and electronic engineering. Research projects range from microcomputers to major activities in the fields of computer systems and digital systems.

Applications are invited from suitably qualified persons for the above position. The successful candidate will be expected to teach and carry out research in one or more of the following areas: computer, educational research, evaluation, research design and data analysis, special education, and educationally disabled persons. Well qualified applicants would be considered for appointment at Senior Lecturer level.

Salary: £22,500-£25,000 per annum. Lecturer: £22,500-£24,000; Senior Lecturer: £24,000-£25,000. This is a tenurable appointment.

Further particulars are available from the Secretary General, Association of Commonwealth Universities (ASCU), 38 Gordon Square, London WC1H 0PE. The Registrar of the University of Otago, Dunedin, New Zealand.

Applications close on 13 May 1984.

University of Cambridge
King's College
DOMUS BURSAR

The College intends to appoint a Domus Bursar to take office as soon as possible. The appointee will be responsible for the financial management of the College and will be expected to teach and carry out research in one or more of the following areas: computer, educational research, evaluation, research design and data analysis, special education, and educationally disabled persons. Well qualified applicants would be considered for appointment at Senior Lecturer level.

Salary: £22,500-£25,000 per annum. Lecturer: £22,500-£24,000; Senior Lecturer: £24,000-£25,000. This is a tenurable appointment.

Further particulars are available from the Secretary General, Association of Commonwealth Universities (ASCU), 38 Gordon Square, London WC1H 0PE. The Registrar of the University of Otago, Dunedin, New Zealand.

Applications close on 13 May 1984.

Colleges of Art
Norfolk County Council
Norwich School of Art

St George Street
Norwich
Norfolk NR3 1BB

Fellowships

OXFORD UNIVERSITY DEPARTMENT
OF ENGINEERING SCIENCE
AND ST. JOHN'S COLLEGE
PLESSEY
RESEARCH FELLOWSHIP

Applications are invited for the Plessey Research Fellowship in Physical Electronics (with a preference given to Opto-Electronics). The Fellowship is funded by The Plessey Company and will be held in the Department of Engineering Science and St. John's College, Oxford.

It is anticipated that the successful candidate will not exceed 30 years of age and will have a Ph.D. in Engineering or Physics or equivalent industrial research experience. The appointment would be for a period of three years with a possibility of renewal for a further two years. It would commence on 1st October 1984 or earlier. The salary (which is pensionable) would be on a scale starting currently at £8350 at age 25 or under, (£10,250 at 29), rising by annual increments and subject to revision in line with general increases in academic salaries.

St. John's would provide a room in College plus full lunching and dining rights, without charge at High Table.

The Plessey Company would offer a consultancy during the Fellowship and would offer employment to the person appointed on termination of the Fellowship, but the Fellow would be free to seek employment where he or she chose.

The Plessey Company would make a contribution to re-location expenses on taking up the Fellowship in accordance with its own practice.

Application forms and further particulars may be obtained from... the President's Secretary, St. John's College, Oxford, OX1 3JP.

Polytechnics

ROBERT GORDON'S INSTITUTE OF
TECHNOLOGY, ABERDEEN
SECRETARY TO
THE INSTITUTE

Applications are invited from suitably qualified and experienced persons for the above post.

RGIT is the largest Central Institution in Scotland and conducts courses at Degree and Postgraduate level. The student full-time equivalent is currently 3700, and the annual recurrent expenditure is approaching £12 million.

Applicants should hold a Degree or relevant Professional Qualification and have had considerable administrative experience, preferably in Higher Education. The salary, at present under review, is at an appropriate level for a post of this standing in public service.

Further details and Application Forms can be obtained from the Principal, Robert Gordon's Institute of Technology, Schoolhill, Aberdeen, AB9 1FR, with whom applications should be lodged by 4th May, 1984.

(14480)



RECTOR

Applications are invited for the vacant post of Rector, the Principal of an institution directly descended from the original Polytechnic and now a broadly-based and diversified organisation at the forefront of academic, professional and continuing education and research, with emphasis on serving the needs of industry and commerce. Academic attainments and wide interest are important but the successful candidate must also show evidence of successful management experience and a capacity for imaginative leadership.

The salary is £29,550 per annum inclusive of London Allowance (under review with effect from 1.4.1984). For further particulars write to the Personnel Officer, PCL 309 Regent Street, London W1R 8AL. Applications should be submitted to the Chairman of the Court of Governors by 30 April 1984.

(14480)

EDUCATION
DEPARTMENT
HEAD OF DEPARTMENT OF
EDUCATION
GRADE VI - Ref No L/1

Bristol Polytechnic wishes to appoint a new Head of the Department of Education with effect from 1 September 1984 when the present postholder retires. Applicants must show considerable knowledge and experience of the whole field of teaching and teacher education. A number of relevant research projects would be an advantage. The Department is moving into a new and important development now that the effects of the merger with the Polytechnic of the two former Colleges of Education (Purdus and St Matthias) have been worked through.

SALARY SCALE: £16,832 - £18,327 per annum. For further details and an application form, to be returned by April 1984, please contact the Personnel Office, Bristol Polytechnic, Coldharbour Lane, Frenchay, Bristol or 0117 556261 Ext. 216 or 217. Please quote Reference Number L/1 in all communications.

KINGSTON POLYTECHNIC
GRADE VI HEAD
MECHANICAL ENGINEERING

Applications are invited from highly qualified candidates for a post which offers a prime opportunity to a professional mechanical engineer. The Head appointed will be responsible under the Dean of Engineering for the staff courses of the School of Mechanical, Aeronautical and Production Engineering and should therefore have experience appropriate to the running of modern degree courses towards design and manufacture.

Candidates should have direct knowledge and experience of industry and will be able to take an active lead in pursuing, promoting research. The title of Professor could be awarded to a candidate of appropriate standing. The post is to be held on a full-time basis. The salary range is £17,277 - £20,000 inclusive of London allowance.

Details and application forms (to be returned by 4th May) from Academic Registry, Dept AO, Kingston Polytechnic, Penrhyn Road, Kingston upon Thames KT1 2EE. Tel: 01-849 1366 ext 518.

DUNDEE COLLEGE OF TECHNOLOGY
DEPARTMENT OF MOLECULAR & LIFE SCIENCES
SENIOR LECTURESHIP OR
LECTURESHIP IN NURSING

Applicants must be registered nurse teachers with relevant experience in any major field of nursing and should be qualified in the teaching of nursing. The successful candidate will be expected to teach and carry out research in one or more of the following areas: computer, educational research, evaluation, research design and data analysis, special education, and educationally disabled persons. Well qualified applicants would be considered for appointment at Senior Lecturer level.

Salary: £17,277-£20,000 per annum. Lecturer: £17,277-£18,327; Senior Lecturer: £18,327-£19,378. This is a tenurable appointment.

Further particulars are available from the Secretary General, Association of Commonwealth Universities (ASCU), 38 Gordon Square, London WC1H 0PE. The Registrar of the University of Otago, Dunedin, New Zealand.

Applications close on 13 May 1984.

LECTURER II IN MANPOWER STUDIES
£7,816-£11,568
Normally with further advancement to £13,443 (BU)

Applicants should have appropriate academic qualifications and industrial experience, be able to contribute to both undergraduate and postgraduate level and be able to offer one or more of the following specialisms: Personnel Management, Industrial Relations, Organisation and Management Development.

Further details and application forms obtainable from the Personnel Officer, Dundee College of Technology, Bell Street, Dundee DD1 1HD, with whom applications should be lodged by April, 1984.

For all appointments, application forms and further details are available from Personnel Department, Sunderland Polytechnic, Langham Tower, Ryhope Road, Sunderland SR2 7EE or telephone (0783) 76233 Ext 11. Closing date: 20 April 1984. Please quote the appropriate reference number.

(14480)

LECTURER II IN MANPOWER STUDIES
£7,816-£11,568
Normally with further advancement to £13,443 (BU)

Applicants should have appropriate academic qualifications and industrial experience, be able to contribute to both undergraduate and postgraduate level and be able to offer one or more of the following specialisms: Personnel Management, Industrial Relations, Organisation and Management Development.

Polytechnics continued



Applications are invited for the following posts:
Salary ranges: LII £22,500-£24,000; LII/SL £24,000-£25,000; SL £26,000-£27,500; PL £28,000-£29,500.

DEPARTMENT OF APPLIED STUDIES IN ART AND DESIGN

Senior Lecturer in Design History
The Department seeks to appoint an experienced and well qualified historian with a strong interest in contemporary crafts. Ref. A1

Lecturer II/Senior Lecturer in Ceramics
The Department seeks to appoint a well qualified and active designer/craftsman. Experience of or an interest in glass would be an advantage. Ref. A2

Lecturer II/Senior Lecturer in Glass
The Department seeks to appoint a well qualified and active designer/craftsman with an interest in cold working and/or kiln forming. Ref. A3

DEPARTMENT OF PHYSICAL EDUCATION AND CREATIVE STUDIES

Senior Lecturer in Drama in Education
Applicants should have recent experience of teaching Drama, and should hold a relevant degree. Experience in research will be an advantage. Ref. A4

Senior Lecturer Sport Studies/Physical Education
The successful candidate will be expected to contribute to the teaching of research methods. Applicants should have a further area in sport, recreation or physical education which they can teach to degree level. Ref. A5

DEPARTMENT OF TEACHING STUDIES

Senior Lecturer in Business Education
Applicants should have had recent experience as a Secondary School teacher of Business Studies. The post will involve liaison with industry and commerce and with the supervision of students engaged in industrial investigation. Ref. A6

Senior Lecturer in Craft, Design and Technology Education
The post will involve liaison with Colleges of Further Education and local schools and with the supervision of students project work and school experience. Experience of the modular approach to Technology courses and other current curriculum developments in this field is essential. Ref. A7

Lecturer II in Business Studies
Candidates should be qualified teachers with recent relevant experience in schools, to join a small team engaged in Business Studies teacher education. Ref. A8

DEPARTMENT OF MECHANICAL ENGINEERING

LII/SL in Fluid Mechanics and Thermodynamics Ref. A9 and LII/SL in Strength and Elasticity of Materials. Ref. A10

Candidates should have a good honours degree in Engineering. Experience in one or more of the following areas: research, industry, computer-aided engineering, will be an advantage.

DEPARTMENT OF LANGUAGES AND CULTURES

Lecturer II in Film and Television (Fixed term)
The Department seeks to appoint a person with special interests in the British Film Industry to teach on undergraduate and postgraduate courses in Communication Studies. Interests in practical video work would be an advantage. Ref. A11

For all appointments, application forms and further details are available from Personnel Department, Sunderland Polytechnic, Langham Tower, Ryhope Road, Sunderland SR2 7EE or telephone (0783) 76233 Ext 11. Closing date: 20 April 1984. Please quote the appropriate reference number.

(14480)

KINGSTON POLYTECHNIC
Faculty of Arts & Languages

LECTURER II/SENIOR LECTURER IN FRENCH
School of Arts and Languages

Applications are invited for a post in the French Department from linguists with a special interest in developing language teaching on our two degrees: Languages, Economics and Politics and Modern Arts. An awareness of and an interest in contemporary French society are essential and some knowledge of the French economy would be a particular advantage. In addition to the two French degrees, the department teaches French language to students of Business Studies, Economics, Geography and Engineering.

The successful applicant will be expected to play a major part in preparing new language programmes for the two degrees. Salary ranges: Lecturer II/Senior Lecturer £7,880-£14,000 including London allowance. Further details and application forms (to be returned by 30th April) from Academic Registry, Dept. AO, Kingston Polytechnic, Penrhyn Road, Kingston upon Thames KT1 2EE. Tel: 01-849 1366 ext. 518.

(14480)

DEPARTMENT OF LEGAL STUDIES
PRINCIPAL LECTURER IN LAW
(£12,510-£15,744)

Applicants should be solicitors, have a good Honours degree in Law, have substantial experience of teaching on both degree courses and professional courses, and have substantial administrative experience. A higher degree and a record of successful research and publication would be an added advantage.

Further details and form of application from the Staff Officer, Trent Polytechnic, Burton Street, Nottingham NG1 4BU. Closing date 27th April 1984.

(14480)

LEEDS POLYTECHNIC
School of International Studies

SENIOR LECTURER IN GERMAN

Applications are invited from well-qualified linguists in the field of German Studies with a view to appointment as subject leader. Suitable experience in Higher Education associated with academic strength in German language and a relevant specialism is sought.

Salary Scale: £10,683-£12,552 (bar)-£13,443

Details from: The Services Officer, Leeds Polytechnic, Calverley Street, Leeds LS1 3HE. Tel: 0532 462365. Closing date: 20 April 1984. Please enclose s.a.e.

Leeds is an equal opportunity employer.

(14480)

TRENT POLYTECHNIC
NOTTINGHAM

For all appointments, application forms and further details are available from Personnel Department, Sunderland Polytechnic, Langham Tower, Ryhope Road, Sunderland SR2 7EE or telephone (0783) 76233 Ext 11. Closing date: 20 April 1984. Please quote the appropriate reference number.

(14480)

OXFORD POLYTECHNIC
Department of Engineering

PRINCIPAL LECTURESHIP IN ELECTRONIC ENGINEERING DESIGN
Ref. ENG/11 Salary: £13,443-£15,744 (under review)

SENIOR LECTURER/LECTURER II IN DYNAMICS OF ENGINEERING SYSTEMS
Ref. ENG/12 Salary: £7,816-£11,568 (under review)

TEMPORARY LECTURER II IN MECHANICAL ENGINEERING (ONE YEAR)
Ref. ENG/13 Salary: £7,816-£11,568 (under review)

Applicants for the above posts should hold at least a first degree in engineering or related discipline, together with relevant industrial, teaching or research experience.

Department of Mathematics and Computer Studies

LII/SL in Recombinant DNA Technology
Applicants should have research experience in genetic manipulation techniques and an interest in their application to industrial processes would be an advantage. The person appointed will be expected to establish an active research programme in this area. Ref. A19

DEPARTMENT OF BIOLOGY

LII/SL in Statistics
Applicants should be graduates with research, and academic and/or industrial backgrounds. Experience with Mathematical Modelling in an industrial environment, Stochastic Techniques or Engineering applications would be an advantage. Ref. A20

Lecturers in Computing
Candidates should be graduates with industrial/commercial, research or academic experience in any of the following areas: Data Analysis, Structured Design Methodologies, Prototyping, Application Generators, Fourth Generation Languages, Knowledge-based Systems, Networking, Real-time Systems. Ref. A21

DEPARTMENT OF PHYSICAL SCIENCES

LII/SL in Metallurgy
Candidates should have degree and/or professional qualifications in Metallurgy. Preference will be given to applicants with recent industrial metallurgical experience. Ref. A22

LII/SL in Materials Science
Candidates should have a degree and/or professional qualifications in Materials Science. Preference will be given to applicants with experience in Composites. Ref. A23

LII in Physical Sciences (Two Posts)
(Fixed term 1 September 1984 to 31 August 1985)
Candidates should be graduates holding a degree in the areas of Physics, Materials Science and/or Chemistry. Ref. A24/25

DEPARTMENT OF ELECTRICAL, ELECTRONIC AND CONTROL ENGINEERING

LII/SL in Software Engineering
Candidates are sought with expertise/research interests in Software Engineering and the trade off between hardware and software in the design of systems. Experience in the use of PASCAL, ADA, C, LISP, etc would be an advantage. Ref. A26

Ref. GPE/10 Salary scale: £7,816-£13,443 pa (under review)

Application forms and further details available from the Staff Officer, Oxford Polytechnic, Washington, Oxford OX3 9DF. Tel: 0865 49177. Ext. 364.

Closing date for all posts 18th May 1984.

(14480)

COLCHESTER INSTITUTE
School of Music

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